Vol. 899 Number 1

OFFICIAL GAZETTE

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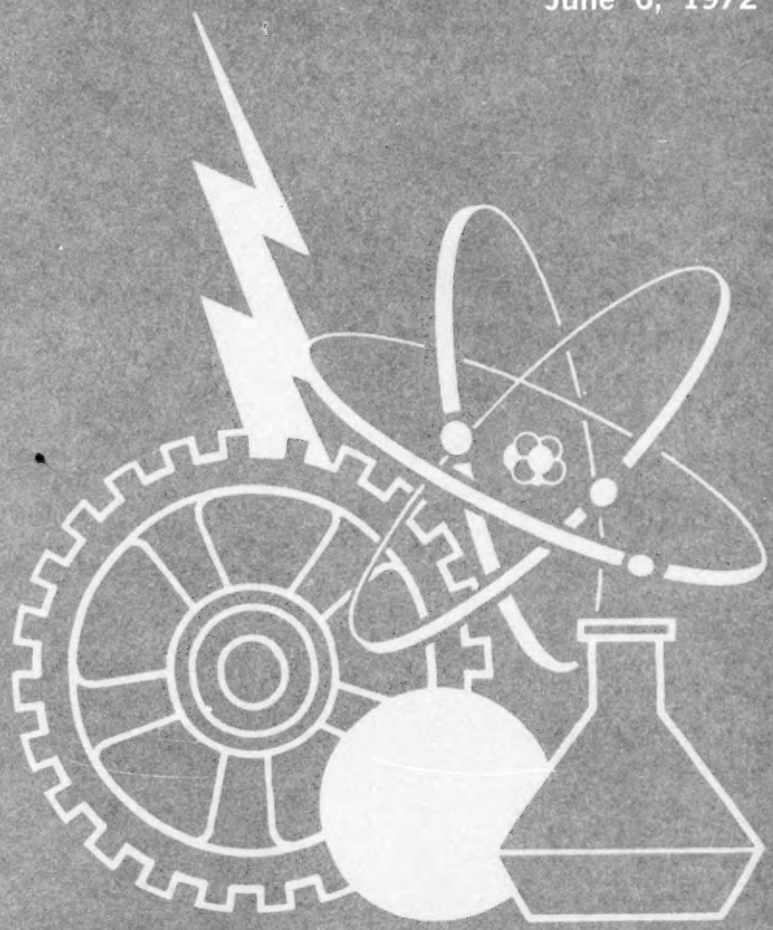
PATENTS

June 6, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 6, 1972 Volume 899 Number 1

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PATENT OFFICE NOTICES

United States District Court for the District of Columbia

RIPPLE TWIST MILLS, INC., Plaintiff
v.
INDUSTRIAL KNITTING CORPORATION, Defendant

Civil Action No. 791—72

ORDER OF PUBLICATION ON ABSENT DEFENDANT IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

The object of this suit under the Patent Laws of The United States is to secure (1) an adjudication of invalidity of United States Letters Patent 3,513,668 granted May 26, 1970, (2) preliminary and permanent injunction against Defendant, its agents, servants, employees and attorneys enjoining them and each of them from asserting or threatening to assert the aforesaid Letters Patent against customers or potential customers of Plaintiff and restraining them and each of them from filing or prosecuting any civil action or action against Plaintiff and/or its customers for infringement of said Letters Patent, (3) costs and attorneys fees, and (4) such other and further relief as may to this Court appear to be just and equitable.

On motion of the Plaintiff, it is this 27th day of April 1972, ordered that the Defendant, INDUSTRIAL KNITTING CORPORATION, a Canadian corporation having a principal place of business at 500 Sauve Street W, Montreal, Quebec, Canada, cause its appearance to be entered herein on or before the fortieth day exclusive of Sundays and legal holidays, occurring after the day of the first publication of this order; otherwise the cause will be proceeded with as in case of default.

WILLIAM B. BRYANT,
Judge.

DEPARTMENT OF COMMERCE
Patent Office

[37 CFR Part 1]

EVIDENCE OF PATENTABILITY OR PRIORITY

Proposed Special Statement in Affidavit or Declaration When Relying Upon Facts, Data, Test Results or Other Evidence

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) the Patent Office proposes to amend Title 37, Code of Federal Regulations, by adding a new § 1.69.

All persons are invited to present their views, objections, recommendations, or suggestions in connection with the proposed new section, to the Commissioner of Patents, Washington, D.C. 20221, on or before June 27, 1972, on which date a hearing will be held at 9 a.m. in Room 8C06, Building 2, Crystal Plaza, 2011 Jefferson Davis Highway, Arlington, Va. 22202. All persons wishing to be heard orally at the hearing are requested to notify the Commissioner of Patents of their Intended appearance. Any written comments or suggestions may be inspected by any person upon written request a reasonable time after the closing date for submitting comments.

New § 1.69 seeks to guard against the omission from facts, data, test results, or other evidence presented in connection with patentability or priority of invention, of known evidence which is inconsistent with that presented or which would convey a different impression. The purpose is to insure presentation to the Patent Office of the evidence needed to make an informed decision on patentability or priority of invention. The section thus requires a verified statement that no such inconsistent evidence is known to the person making the statement, if such is the fact.

The text of the proposed new § 1.69 is as follows:

§ 1.69 *Special statement in affidavit or declaration when relying upon facts, data, test results, or other evidence.*

(a) An affidavit or declaration filed during the prosecution of an application presenting evidence urged as bearing on patentability or priority of invention will be considered only if the applicant or other person making the affidavit or declaration states therein that no evidence is known to him which is inconsistent with that relied on in the affidavit or declaration, or which would tend to give an impression different from that conveyed by the affidavit or declaration.

(b) If, during the prosecution, the applicant, to establish patentability, relies on representations as to facts, data, or test results set forth in the specification, such representations will be considered for that purpose only if applicant files an affidavit or declaration attesting as to the truth of the representations and asserting that no facts, data, or test results are known to him which are inconsistent with those set forth in the specification, or which would tend to give an impression different from that conveyed by the specification.

Dated: April 28, 1972.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved: May 1, 1972.
JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 72-6925 Filed 5-5-72; 8:49 a.m.]

Published in 37 F.R. 9225, May 6, 1972

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,699,054, L. H. Conover, TETRACYCLINE, **filed** July 7, 1966, D.C., E.D.N.Y. (Brooklyn), Doc. 66C640, *Chas. Pfizer & Co., Inc.* v. *Generic Formulae Inc. et ano.* Transferred to U.S.D.C., S.D.N.Y., Mar. 11, 1969.

2,733,226, B. A. Hunter, TRIARYL PHOSPHITE STABILIZERS FOR SYNTHETIC RUBBERS, **filed** Dec. 21, 1967, D.C., N.D. Ohio (Cleveland), Doc. C-67-933, *Uniroyal Incorporated* v. *Firestone Tire and Rubber Co.* Stipulation and order, action dismissed without prejudice, Jan. 12, 1972.

2,737,420, J. C. Wilborn, MEANS FOR BALANCING WHEELS; **3,314,726,** Rehnborg and Wilborn, WHEEL BALANCE CORRECTION DEVICE, **filed** Feb. 4, 1972, D.C., W.D. Okla. (Oklahoma City), Doc. 72-73-C, *John C. Wilborn et al.* v. *Virgil H. Salathiel, Motion Products, Inc.*

2,742,378, T. A. Te Grotenhuis, FILLERS HAVING VINYL SILOXANE GROUPS BONDED TO THE SURFACE THEREOF AND COPOLYMERS THEREOF WITH ETHYLENICALLY UNSATURATED POLYMERIZABLE MONOMERS; **2,841,566,** same, HIGH POLYMERS WITH CHEMICALLY BONDED REINFORCING AND METHOD OF MAKING SAME, **filed** June 10, 1963, U.S. Ct. of App., 6th Cir., Ohio (Cincinnati), App. No. 20845, *Westwood Chemical, Inc.* v. *Owens-Corning Fiberglas Corporation.* The judgment of the District Court is modified by restricting the determination of invalidity to the claims in issue, i.e., claims 1, 2, 4, 6, 7, 8, 11, 14, 15–19, 21, 23–26 and 28 of Patent '378 and claim 8 of Patent '566 and as so modified the judgment is affirmed, decided and filed Aug. 24, 1971.

2,777,926, M. E. Bourns, VARIABLE RESISTOR, **filed** Aug. 11, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1992, *Bourns, Inc. and Marlan E. Bourns* v. *Allen-Bradley Co. et al.* On motion of the defendants for summary judgment, it is ordered that defendants' motion for summary judgment is granted and judgment is entered on the complaint in favor of the defendants, Feb. 7, 1972.

2,841,566. (See 2,742,378.)

2,843,513, R. Stricklen, MIXTURE AND METHOD FOR IMPARTING A CORROSION-RESISTANT SURFACE TO ALUMINUM, ALUMINUM ALLOYS, AND SILVER; **2,851,386,** H. J. Hartman, METHOD FOR COATING ZINC AND ZINC ALLOY SHEETS, **filed** Mar. 16, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c621, *Allied Research Products, Inc.* v. *J. M. Eltzroth & Associates, Inc.* On stipulation of the parties pursuant to F.R.C.P. Rule 41(a) the above action is dismissed, Jan. 5, 1972.

2,851,386. (See 2,843,513.)

3,667,762, R. R. Eby, PHONOGRAPH RECORD STORAGE MEANS, **filed** Dec. 2, 1969, D.C., S.D.N.Y., Doc. 69–5315, *Richard R. Eby* v. *F. W. Woolworth Company.* Stipulation and order, complaint dismissed with prejudice and without costs, Jan. 26, 1972.

3,021,871, F. J. Rodgers, HOSE FOR PORTABLE PNEUMATIC EQUIPMENT, **filed** Feb. 2, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–116, *Samuel Moore & Company* v. *Parker Hannifin Corporation.*

3,178,821, P. C. Kesling, ORTHODONTIC APPLIANCE, **filed** Feb. 4, 1972, D.C., S.D.N.Y., Doc. 72–C–532, *TP Laboratories, Inc. et al.* v. *Betta Orthodontic Supplies, Inc.*

3,190,912, R. E. Robinson, PROCESS FOR PREPARING ESTERS, **filed** Nov. 7, 1969, D.C., S.D. Tex (Houston), Doc. 69–H–1096, *National Distillers & Chemical Corporation* v. *Celanese Corporation.* Stipulation and order of dismissal, Feb. 4, 1972, **Same, filed** Mar. 23, 1970, D.C., S.D. Tex. (Houston), Doc. 70–H–261, *National Distillers and Chemical Corporation* v. *Celanese Corporation.* Stipulation and order of dismissal, Feb. 4, 1972. (Dismissed with prejudice.)

3,195,803, T. E. Ford, FOOD WRAPPER, **filed** Feb. 4, 1972, D.C. Mass. (Boston), Doc. CA–72, *Trans World Services, Inc.* v. *S. S. Kresge Company.*

3,220,857, Hollis and Borders, PROCESS FOR PREPARING DEHYDRATED POTATOES, **filed** Nov. 28, 1969, D.C. Del. (Wilmington), Doc. 3813, *American Potato Company* v. *General Foods Corporation.* Stipulation of dismissal with prejudice as to all claims and counterclaims, Oct. 20, 1971.

3,275,316, G. V. Cleary, INSERT FOR NEWSPAPERS, **filed** Jan. 18, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c134, *Free Standing Stuffer, Inc.* v. *Parent's Magazine Enterprises.* By stipulation, motion for dismissal of the complaint under Rule 41(a)(1)(ii), is granted, Feb. 3, 1972.

3,314,726. (See 2,737,420.)

3,322,288, A. Mayer, CLOTHING DISPLAY RACK ASSEMBLY, **filed** Nov. 9, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2675–FW, *Capitol Hardware Manufacturing Company, Inc.* v. *Reeve Company.*

3,325,799, R. L. Farris, MATTRESS ALARM, **filed** Feb. 3, 1972, D.C., N.D. Tex. (Fort Worth), Doc. CA–4–1899, *Robert L. Farris and Edwin G. Cohen* v. *Electronic Monitors Inc. and Harris Hospital.*

3,367,809, R. S. Soloff, SONICS, **filed** Oct. 13, 1970, D.C. Conn. (New Haven), Doc. 14081, *Branson Instruments, Incorporated* v. *Sonics and Materials, Inc., Robert S. Soloff.* Consent judgment, defendants enjoined, Nov. 26, 1971.

3,390,480, L. S. Turner, ARROW-HELICOPTER TOY; **D. 212,699,** same, AERIAL TOY; **Reg. No. 841,173** (ARROW-COPTER), Basic Products Development Company, **filed** Feb. 5, 1969, D.C.N.J. (Newark), Doc. 132–69, *Basic Products Development Co., Inc.* v. *Plawner Toy Mfg. Co., Inc., Felix Plawner and Karl Plawner.* Order dismissing complaint, Oct. 20, 1971.

3,409,916, Billig and Schleeweiss, OVAL SWIMMING POOL, **filed** June 3, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–677, *Bilnor Corp.* v. *Atreo Mfg. Co., Inc.* Case dismissed, Jan. 31, 1972.

3,452,966, L. Smolski, LIQUID TREATMENT APPARATUS AND METHOD, **filed** Feb. 3, 1972, D.C. Mass. (Boston), Doc. 72–433–J, *Polcon Corporation* v. *Kenics Corporation.*

3,481,065, M. L. Whaley, PURSE RING STRIPPER AND METHOD OF USING SAME, **filed** June 14, 1971, D.C., S.D. Calif. (San Diego), Doc. No. 71–191–N, *Morris L. Whaley* v. *Campbell Machine, Inc.*

3,488,770, W. T. Atkinson, MEAT-LIKE PROTEIN FOOD PRODUCT, **filed** Aug. 18, 1971, D.C., S.D. Ill. (Peoria), Doc. P–3278, *Archer Daniels Midland Company* v. *Ralston Purina Company and Swift and Company.*

3,545,014, E. Davis, SANITIZERS, **filed** Feb. 2, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–241–AAH, *Elbert Davis* v. *Days-Ease Home Products Corp.*

D. 212,699. (See 3,390,480.)

Reg. No. 841,173. (See 3,390,480.)

Dedication

Re. 26,759.—*Frederick J. Melges*, Battle Creek, Mich. GYNECOLOGY OR LITHOTOMY DRAPE. Patent dated Jan. 6, 1970. Dedication filed Apr. 14, 1972, by the inventor.

Hereby dedicates to and for the free use of the Public all of the claims of said patent.

Certificates of Correction for the Week of June 6, 1972

Re. 27,085	3,609,678	3,623,434	3,630,706
3,383,443	3,609,730	3,623,560	3,630,717
3,456,286	3,610,361	3,623,753	3,630,727
3,462,794	3,610,825	3,623,832	3,630,796
3,488,701	3,612,053	3,623,940	3,630,863
3,489,592	3,612,055	3,623,955	3,631,042
3,522,674	3,612,311	3,623,988	3,631,057
3,534,063	3,612,396	3,624,076	3,631,071
3,545,892	3,612,723	3,624,079	3,631,090
3,546,123	3,612,902	3,624,166	3,631,173
3,546,270	3,613,105	3,624,250	3,631,176
3,551,427	3,613,273	3,624,260	3,631,182
3,556,310	3,614,060	3,624,370	3,631,318
3,558,933	3,614,818	3,624,395	3,631,321
3,563,830	3,615,223	3,624,538	3,631,357
3,570,018	3,615,320	3,624,568	3,631,481
3,574,827	3,615,429	3,624,970	3,631,503
3,575,991	3,615,435	3,625,352	3,631,563
3,577,237	3,615,639	3,625,492	3,631,571
3,578,652	3,615,762	3,625,501	3,631,858
3,578,843	3,615,788	3,625,584	3,631,959
3,580,919	3,616,360	3,625,877	3,632,046
3,583,075	3,616,444	3,625,978	3,632,058
3,583,352	3,616,784	3,625,993	3,632,060
3,584,740	3,617,070	3,626,048	3,632,154
3,584,941	3,617,368	3,626,149	3,632,157
3,586,152	3,617,478	3,626,253	3,632,261
3,588,779	3,617,479	3,626,261	3,632,371
3,590,035	3,617,489	3,626,266	3,632,401
3,590,559	3,617,490	3,626,382	3,632,427
3,590,902	3,617,672	3,626,733	3,632,461
3,591,110	3,617,747	3,627,016	3,632,475
3,592,373	3,617,751	3,627,153	3,632,599
3,592,626	3,618,003	3,627,260	3,632,631
3,594,762	3,618,073	3,627,318	3,632,865
3,595,256	3,618,331	3,627,376	3,632,902
3,595,908	3,618,746	3,627,386	3,632,991
3,596,675	3,619,173	3,627,429	3,633,112
3,597,437	3,619,183	3,627,536	3,633,163
3,598,344	3,619,195	3,627,552	3,633,210
3,598,868	3,619,210	3,627,554	3,633,327
3,599,022	3,619,480	3,627,566	3,633,400
3,599,053	3,619,605	3,627,677	3,633,431
3,599,265	3,619,938	3,627,689	3,633,628
3,600,456	3,620,266	3,627,776	3,633,823
3,600,953	3,620,302	3,628,037	3,633,950
3,601,585	3,620,374	3,628,072	3,633,981
3,601,963	3,620,620	3,628,129	3,634,134
3,602,282	3,620,665	3,628,313	3,634,325
3,602,470	3,620,677	3,628,533	3,634,452
3,602,689	3,620,693	3,628,658	3,634,550
3,603,235	3,620,714	3,628,714	3,634,659
3,603,265	3,620,746	3,628,910	3,634,741
3,603,463	3,620,867	3,628,914	3,635,147
3,603,585	3,620,961	3,628,942	3,635,269
3,603,738	3,621,019	3,628,953	3,635,371
3,603,981	3,621,082	3,628,957	3,635,457
3,604,320	3,621,091	3,628,963	3,635,669
3,605,654	3,621,146	3,628,973	3,635,731
3,607,334	3,621,164	3,628,994	3,635,776
3,607,692	3,621,402	3,629,013	3,635,932
3,607,797	3,621,485	3,629,064	3,635,955
2,607,876	3,621,842	3,629,209	3,636,022
3,608,557	3,622,084	3,629,227	3,636,023
3,608,572	3,622,166	3,629,233	3,636,170
3,608,646	3,622,461	3,629,443	3,636,246
3,609,075	3,622,517	3,629,444	3,636,335
3,609,282	3,622,522	3,629,525	3,636,421
3,609,415	3,622,977	3,629,683	3,636,521
3,609,511	3,623,015	3,629,895	3,636,545
3,609,658	3,623,235	3,630,639	3,637,588
3,637,773	3,639,512	3,642,238	3,645,942
3,637,905	3,639,738	3,642,434	3,646,468
3,638,302	3,640,158	3,642,439	3,646,663
3,638,399	3,640,389	3,643,738	3,647,241
3,638,538	3,641,132	3,643,739	
3,639,335	3,641,342	3,644,018	
3,639,352	3,642,067	3,644,194	

Disclaimers

3,310,559.—*Sterling Beckwith*, Libertyville Township, Ill. MULTIPLE JET CONDITIONING CABINET. Patent dated Apr. 28, 1964. Disclaimer filed Apr. 10, 1972, by the assignee, *Kysor Industrial Corporation*.

Hereby enters this disclaimer to claims 1, 2, 5 and 6 of said patent.

3,602,287.—*Martin Eversdyk*, Bedford Heights, Ohio. APPARATUS FOR FORMING A MEMBER FROM A SLURRY OF MATERIAL. Patent dated Aug. 31, 1971. Disclaimer filed Mar. 23, 1972, by the assignee, *Oglebay Norton Company*.

Hereby enters this disclaimer to claims 1 through 5 of said patent.

Patents Withdrawn From Register

RCA Corporation withdraws the following patents from the Register of Patents Available for Licensing or Sale. The patents were listed as being available, in the OFFICIAL GAZETTE as indicated below:

3,273,476. PHOTOCOMPOSING SYSTEM, Feb. 14, 1967.

3,281,738. SUPERCONDUCTING SOLENOID, Mar. 28, 1967.

3,302,168. TRAFFIC CONTROL SYSTEM, July 18, 1967.

3,302,901. FLUID DRIVE SYSTEM FOR FILM TAKE-UP AND REWIND MECHANISM, July 18, 1967.

3,344,527. SUBSTANTIALLY LINEAR OUTPUT GAG DEVICE, Jan. 2, 1968.

3,351,938. VEHICLE IDENTIFICATION APPARATUS, Jan. 30, 1968.

3,355,618. ELECTRON GUN FOR USE IN A CATHODE RAY TUBE EXHIBITING ENHANCED ELECTRON EMISSION, Jan. 30, 1968.

3,363,961. CATHODE ARRANGEMENT OF AN ELECTRON MICROSCOPE FOR REDUCING THE OCCURENCE OF VIRTUAL CATHODES, Mar. 14, 1968.

3,393,847. FILM THREADING ARRANGEMENT, Sept. 24, 1968.

3,399,405. VEHICLE IDENTIFIER SYSTEM, Oct. 22, 1968.

3,405,264. SPECIMEN INJECTOR FOR ELECTRON MICROSCOPES WITH ROTATABLE SPECIMEN HOLDER, Jan. 14, 1969.

3,452,241. ELECTRON GUN SUITABLE FOR ELECTRON MICROSCOPE, Sept. 9, 1969.

3,479,934. PHOTOCOMPOSING APPARATUS SUPPORT STRUCTURE, Jan. 27, 1970.

3,487,909. ARTICLE HANDLING APPARATUS, July 21, 1970.

3,500,310. TRUE PRESENCE VEHICLE DETECTOR INCLUDING MEANS TO DISTINGUISH BETWEEN SLOW AMBIENT CHANGES AND CHANGES TO THE PRESENCE OF A VEHICLE, July 21, 1970.

3,509,803. PHOTOCOMPOSING APPARATUS, Aug. 25, 1970.

3,517,119. DEVICE FOR PRODUCING LINE HALFTONE IMAGES SIMILAR TO THE IMAGES PRODUCED BY THE WOODCUT TYPE METHOD OF PRINTING, Aug. 3, 1971.

3,528,018. BILEVEL VIDEO SIGNAL RECONSTRUCTION CIRCUIT, Aug. 3, 1971.

3,546,681. PROGRAMMED METHOD FOR MANIPULATING ELECTRONIC FONTS IN ELECTRONIC PHOTOCOMPOSING SYSTEMS, Aug. 3, 1971.

3,553,676. ELECTRO-OPTICAL COMPOSITION SYSTEM, Aug. 3, 1971.

3,568,178. ELECTRONIC PHOTOCOMPOSITION SYSTEM, Dec. 7, 1971.

3,573,786. COMPENSATION CIRCUIT FOR ELECTRONIC PHOTOCOMPOSITION SYSTEM, Dec. 7, 1971.

3,614,767. ELECTRONIC PHOTOCOMPOSING SYSTEM THAT FORMS CHARACTERS OF DIFFERENT POINT SIZES, Dec. 21, 1971.

3,643,019. VARIABLE LENGTH CODING METHOD AND APPARATUS, May 2, 1972.

Patents Available for Licensing or Sale

D. 223,093. LIGHTENING INSULATOR PAD FOR CAMPERS. John B. Cato, 206 Combs St., Milton, Fla., 32570.

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court, E., Syosset, N.Y., 11791.

3,225,761. FATIGUE SUPPORT. Robert Swenson, 120 Poinciana Drive, Martinez, Ga., 30907.

3,525,099. HAND GUIDED WALK-BEHIND SELF-PROPELLED MATERIAL CONVEYING CART. John Fuhrmann. Correspondence to: Robert C. Weber, 1022 Ellicott Square, Buffalo, N.Y., 14203.

3,528,670. ASTRONOMICAL TELEOBJECTIVE. Lawrence Monari, 1458 83rd St., Brooklyn, N.Y., 11228.

3,625,664. PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS. Carlo Padovani. Correspondence to: Murphy & Dobyns, 2001 Jefferson Davis Highway, Suite 307, Arlington, Va., 22202.

3,645,530. RANDOMLY BALL AND GAME APPARATUS. Edward A. Hernandez, et al., 1500 Elevado St., Los Angeles, Calif., 90026.

3,651,623. APPARATUS AND METHOD FOR MOWING STEEP EMBANKMENTS. Rutherford B. Harley, 4300 Bishop Lake Rd., Marietta, Ga., 30060.

3,652,508. VISCOSITY STABLE ALIPHATIC POLYURETHANE COMPOSITIONS AND METHOD OF PREPARATION. Donald L. Segur, et al. Correspondence to: Henry B. Townsend, General Latex and Chemical Corp., Research Center, High St., North Billerica, Mass., 01862.

The following 2 patents are offered by Louis Schacher, et al., 4910 15th Ave., Brooklyn, N.Y., 11219.

D. 191,069. BOTTLE.

D. 191,770. BOTTLE.

General Electric Company is prepared to grant non-exclusive licenses under the following 2 patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa., 19101.

3,629,596. FREE PISTON GENERATOR.

3,647,925. VARIABLE IMPEDANCE GENERATOR.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 3 patents upon reasonable terms.

Applications for license may be addressed to: The Director, Patent Section, General Motors, Building, 3044 West Grand Blvd., Detroit, Mich., 48202.

3,471,127. TURBOMACHINE ROTOR.

3,477,647. FUEL SPRAY.

3,478,816. REGENERATOR MATRIX.

The Department of Health, Education, and Welfare is offering the following 13 patents for licensing as provided by Title 45 C.F.R. Section 6.3.

Applications for license should be addressed to: Mr. Norman J. Latker, Chief, Patent Branch, % National Institutes of Health, Room 5A03, Westwood Building, Bethesda, Md., 20014.

3,642,953. SELECTIVELY SULFONATED BLOCK COPOLYMERS AND PROCESS FOR THEIR PREPARATION.

3,644,647. TREATMENT OF GLAUCOMA EMPLOYING 5-(3-METHYLAMINOPROPYL) 5H-DIBENZO (a,d) CYCLOHEPTENE.

3,646,594. PROCESS FOR REMOVAL OF ACIDIC MATERIALS FROM FLUIDS.

3,651,864. COMPACT ROOM SIZE ENVIRONMENTAL CONTROL UNIT.

3,652,530. ANTIHEMOPHILIC FACTOR PREPARED FROM BLOOD PLASMA USING POLYETHYLENE GLYCOL.

3,654,257. DIAZO DERIVATIVES OF IMIDAZOLE CARBOXYLIC ACID ESTERS.

3,651,212. ATTENUATED LIVE RUBELLA VIRUS VACCINE AND METHOD OF PRODUCTION.

3,649,613. TRIAZENO COMPOUNDS.

3,655,815. THROMBORESISTANT ARTICLES CONTAINING EPOXY RESINS AND POLYETHYLENE-OXIDE POLYPROPYLENE OXIDE BLOCK COPOLYMERS.

3,655,123. CONTINUOUS FLOW BLOOD SEPARATOR.

3,663,659. PROCESS FOR THE PREPARATION OF HYDROXYLATED BLOCK POLYMERS.

3,666,187. LABORATORY HOMOGENIZER.

3,665,762. CALORIMETER.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 42 patents.

Inquiries respecting licenses under these patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of Americas, New York, N.Y., 10036.

3,653,411. CABLE HARNESS ASSEMBLY BOARD AND METHOD OF MAKING THE SAME.

3,653,498. STATIC CHARGE PROTECTIVE PACKAGES FOR ELECTRON DEVICES.

3,653,608. WEB CARTRIDGE.

3,653,745. CIRCUITS FOR DRIVING LOADS SUCH AS LIQUID CRYSTAL DISPLAYS.

3,653,883. METHOD OF FABRICATING A POROUS TUNGSTEN BODY FOR A DISPENSER CATHODE.

3,653,901. COLOR KINESCOPE PRODUCTION WITH A TEMPORARY MASK.

3,653,941. SLURRY PROCESS FOR COATING PARTICULATE MATERIAL UPON A SURFACE.

3,653,989. ZN DIFFUSION INTO GAP.

3,654,387. VIDEO TAPE RECORDER SYNCHRONIZING SYSTEM.

3,654,398. DEVICE TO KEEP A CAPSTAN IN PHASE WHEN SWITCHING MODES.

3,654,400. WEB HANDLING APPARATUS.

3,654,440. COUNTER.

3,654,441. FOUR-PHASE HIGH SPEED COUNTER.

3,654,556. MICROWAVE HYBRID COMPRISING TROUGH WAVEGUIDE AND BALANCED MIXER UTILIZING SAME.

3,654,572. WAVEGUIDE STRUCTURE.

3,654,606. ALTERNATING VOLTAGE EXCITATION OF LIQUID CRYSTAL DISPLAY MATRIX.

3,655,126. MOTION TRANSFER MECHANISM.

3,655,269. LIQUID CRYSTAL DISPLAY ASSEMBLY HAVING INDEPENDENT CONTRAST AND SPEED OF RESPONSE CONTROLS.

3,655,912. CORONA GENERATING CIRCUITS FOR ELECTROPHOTOGRAPHIC PRINTERS COOPERATIVELY OPERATING WITH TELEVISION RECEIVERS.

3,656,011. CHARGE COUPLED DEVICE.

3,656,030. SEMICONDUCTOR DEVICE WITH PLURALITY OF SMALL AREA CONTACTS.

3,656,062. LIGHTNING PROTECTION SYSTEM.

3,656,071. WIDE BAND BALUN.

3,656,121. ELECTRICALLY AND OPTICALLY ACCESSIBLE MEMORY.

3,657,138. VISIBLE-EMITTING CERIUM-ACTIVATED CALCIUM ALUMINUM OXIDE PHOSPHOR.

3,657,674. COIL SUSPENSION ARRANGEMENT FOR A CATHODE RAY TUBE.

3,657,735. ELECTRON BEAM EXCITED LASER.

3,658,125. INTERNAL CONFIGURATION FOR A RADIAL HEAT PIPE.

3,658,400. METHOD OF MAKING A MULTIALKALI PHOTOCATHODE WITH IMPROVED SENSITIVITY TO INFRARED LIGHT AND A PHOTOCATHODE MADE THEREBY.

3,658,401. METHOD OF MANUFACTURE OF CATHODE RAY TUBES HAVING FRIT-SEALED ENVELOPE ASSEMBLIES.

3,658,403. HIGH FIDELITY READOUT OF A HOLOGRAM PERFORMING THE FUNCTION OF A COMPLEX WAVE MODIFYING STRUCTURE.

3,658,404. COMPLEX WAVE MODIFYING STRUCTURE HOLOGRAPHIC SYSTEM.

3,658,586. EPITAXIAL SILICON ON HYDROGEN MAGNESIUM ALUMINATE SPINEL SINGLE CRYSTALS.

3,658,672. METHOD OF DETECTING THE COMPLETION OF PLASMA ANODIZATION OF A METAL ON A SEMICONDUCTOR BODY.

3,659,035. SEMICONDUCTOR DEVICE PACKAGE.

3,659,044. TEST SYSTEM FOR ELECTRICAL APPARATUS.

3,659,118. DECODER CIRCUIT EMPLOYING SWITCHES SUCH AS FIELD EFFECT DEVICES.

3,659,164. INTERNAL CONSTRUCTION FOR PLASTIC SEMICONDUCTOR PACKAGES.

3,659,222. HIGH EFFICIENCY MODE AVALANCHE DIODE OSCILLATOR.

3,659,223. MICROWAVE OSCILLATOR WITH TWO OR MORE PARALLELED SEMICONDUCTIVE DEVICES.

3,659,228. STRIP-TYPE DIRECTIONAL COUPLER HAVING ELONGATED APERTURE IN GROUND PLANE OPPOSITE COUPLING REGION.

3,659,232. TRANSMISSION LINE FILTER.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 16, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-18-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-03-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-09-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	9-21-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-12-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-19-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	3-01-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-19-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-23-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-01-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-12-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	5-21-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during June 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... **Numbers 2,709,808 to 2,712,130, inclusive**
Plant Patents..... **Numbers 1,396 to 1,403, inclusive**

PATENTS

GRANTED JUNE 6, 1972

GENERAL AND MECHANICAL

3,667,069

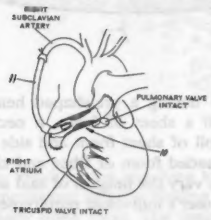
JET PUMP CARDIAC REPLACEMENT AND ASSIST DEVICE AND METHOD OF AT LEAST PARTIALLY REPLACING A DISABLED RIGHT HEART

Perry L. Blackshear, Mahtomedi; Richard J. Forstrom; Frank D. Dorman, both of St. Paul, and Demetre M. Nicoloff, Minneapolis, all of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Mar. 27, 1970, Ser. No. 23,388

Int. Cl. A61f *1/24; F04f 5/00, 5/36, 5/44*

U.S. Cl. 3—1 **12 Claims**



An implantable jet pump cardiac replacement device and method for replacing or assisting the right heart. The jet pump device is an elongated tubular structure including an upstream driving nozzle from which a driving flow of arterial blood under pressure is ejected into a suction nozzle creating a zone of reduced pressure to cause venous blood to be sucked into and admixed with the driving flow for distribution to the pulmonary circulation system. The pump may be powered by blood pumped by the left heart or an artificial replacement for the left heart.

3,667,070

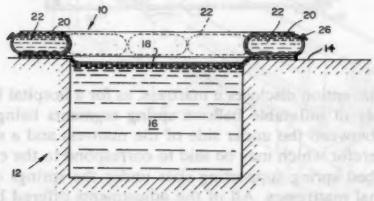
POOL COVER

Joseph J. Pitti, Wantagh, and George A. Tassone, Brooklyn, both of N.Y., assignors to Atreo Manufacturing Co., Inc., Brooklyn, N.Y.

Filed July 22, 1970, Ser. No. 57,279

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.12 **7 Claims**



a pool cover for keeping soot and other particles out of a pool and for preventing unwanted usage of the pool. The pool cover is made of a flexible, durable material and has a central cover portion adapted to rest on the surface of the pool. A border region is secured to the outer edge of the central cover portion including a plurality of separate and independent liquid containers capable of being filled with a suitable liquid, such as water. The border region of the pool cover rests on the peripheral edge of the pool and is too heavy to be removed by a child of tender years. If one of the liquid containers inadvertently ruptures, the others will not be affected and the pool cover will be maintained in place.

3,667,071

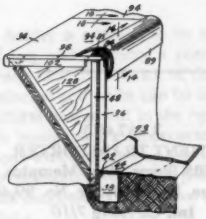
SWIMMING POOL LINER HANGER ASSEMBLY

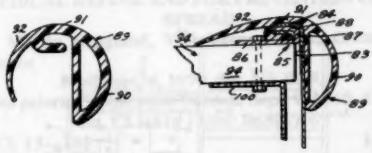
Monroe P. Hoch, Wapwallopen, Pa., and Joseph Barrera, Long Beach, N.Y., assignors to Wilkes Pool Corporation, Berwick, Pa.

Original application Dec. 12, 1967, Ser. No. 689,886, now Patent No. 3,546,720. Divided and this application Aug. 5, 1970, Ser. No. 61,408

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.21 **3 Claims**





A hanger assembly for securing a pool liner to the deck of a swimming pool including a rigid hook secured to the pool deck, a second hook adapted to be secured to the pool liner engaging the rigid hook, and a coping means substantially covering both hooks and aiding in retaining the hook engagement is disclosed. The assembly, when the coping means is in place, presents a relatively smooth rounded exterior transition surface between the pool deck and pool liner.

3,667,072

DIVAN-BED

Enzo Bellini, Via della Liberta 37, Quarrata, Italy

Filed Nov. 2, 1970, Ser. No. 86,137

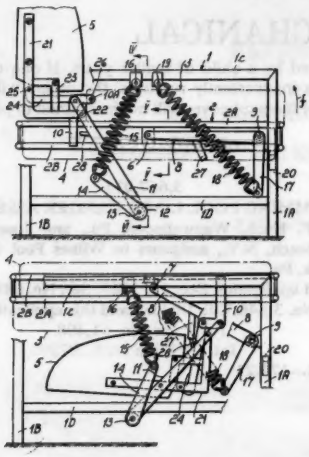
Claims priority, application Italy, Nov. 5, 1969, 4847 A/69

Int. Cl. A47c *17/22, 17/36*

U.S. Cl. 5—24 **4 Claims**

A divan bed, including a fixed supporting structure, a frame tiltable in two positions displaying for use in one of the

positions seat cushions and in the other a mattress. It further comprises a back that in the bed arrangement is admitted



under the frame to sustain the cushions and is articulated to said frame.

3,667,073

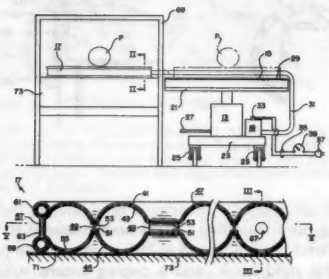
PATIENT TRANSPORTER

Hiram H. Renfroe, 505 Burns, West Memphis, Ark.

Filed Dec. 18, 1970, Ser. No. 99,400

Int. Cl. A61g 7/10

U.S. Cl. 5—81 **11 Claims**



An apparatus which provides for effortless moving of a non-ambulatory patient from his bed or operating table to a cart, e.g., recovery room stretcher or the like and from the cart to other non-porous surfaces, e.g., X-ray tables, etc. The major component comprises an inflatable mattress having a constant flow of air pressure communicating therewith and a plurality of nozzles over one side thereof to direct air jets outwardly therefrom. The mattress normally is positioned with the air jets directed downwardly to provide an air cushion or caster for effortless sliding from one horizontal surface to another. However, the mattress may be positioned with the air jets directed upwardly for floatably supporting a patient, having sores, e.g., decubitus ulcers, on a cushion of pressurized gas a distance above the mattress.

3,667,074

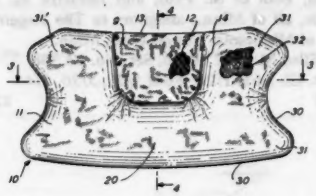
STUFFED CONTOURED PILLOWS

William M. Emery, New Providence, N.J., assignor to William W. Emery, Township of Berkeley Heights, Union County, N.J.

Filed Aug. 26, 1969, Ser. No. 853,104

Int. Cl. A47c 23/06

U.S. Cl. 5—337 **4 Claims**



A head pillow having a pre-shaped head cradle padded permanently with a sheet of foam, a neck roll adjustably padded with a roll of sheet foam and side wings adjustably padded with shreaded foam or fiber and zippered means to provide access to vary the heighth of said adjustable padding according to the user's individual requirements.

3,667,075

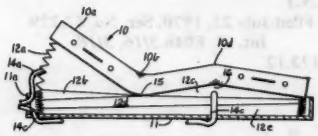
MATTRESS SPRING BELLOWS ASSEMBLY AS FOR HOSPITALS, AND THE LIKE

Wesley D. Ballard, c/o S. M. Tucker, 1011 North 15th Street, and John H. Staley, 4512 Timbercrest Lane, both of Waco, Tex.

Filed Feb. 24, 1970, Ser. No. 13,601

Int. Cl. A47c 27/08

U.S. Cl. 5—348 **7 Claims**



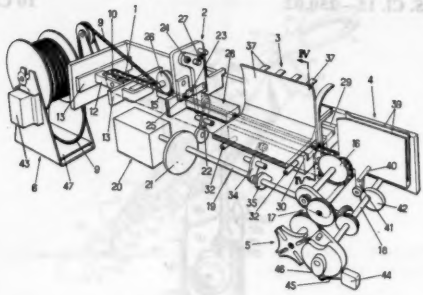
The invention discloses a mattress, as for a hospital bed, an assembly of inflatable bellows spring segments being interposed between the under side of the mattress and a support box therefor which may be said to correspond to the conventional bed spring supporting slats under the springs of conventional mattresses. All of the adjustments offered by conventional hospital bed frames, and more, may be made for the mattress of this invention by virtue of the shapes into which the combinations of spring bellows segments may be inflated. The invention, in effect, employs a careful selection of bellows spring segment shapes, not only to provide a wide range of positional adjustments of the mattress, but these segments may serve, cooperatively, to provide the springs of the mattress, also with the degree of spring or cushioning effect being infinitely adjustable by virtue of the selective inflation of bellows segments, and the selectivity provided as to degree of inflation of the respective bellows.

3,667,076

BINDING MACHINE

Jacques Aglaghanian, 12 Residence les Quinconces, 19 Gif-sur-Yvette, and Jean Drevet, 30 Avenue du Bois de la Marche, 92 Vaucresson, both of France

Filed Nov. 20, 1970, Ser. No. 91,317
Claims priority, application France, Nov. 20, 1969, 6939991
Int. Cl. B42c 5/12
U.S. Cl. 11—1 A 6 Claims



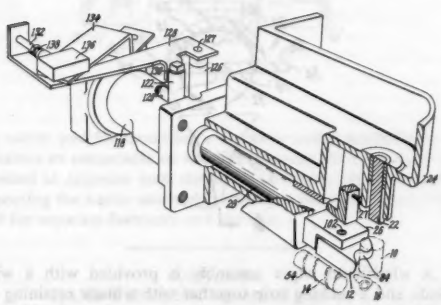
Semi-automatic machine for attaching to perforated bundles of leaves a continuous metallic binding comprising a succession of originally open rings. The machine comprises a reel for delivering the binding, and a chain along which the binding is advanced from a cutting station to a pressing station at which the rings are closed through the perforations in the bundle.

3,667,077

SHOE LASTING MACHINES

Richard A. Steane, Leicester, England, assignor to USM Corporation, Boston, Mass.

Filed Jan. 18, 1971, Ser. No. 107,179
Claims priority, application Great Britain, Jan. 17, 1970, 2,380/70
Int. Cl. A43d 21/00
U.S. Cl. 12—8.3 7 Claims



A shoe lasting machine having a block yieldably pressing the margin of a shoe upper against a drive roll for tensioning the upper heightwise of a last and for feeding the upper margin lengthwise, the block being yieldingly pivotable to increase the entering space between the block and the periphery of the roll to accommodate increased thickness of the upper margin fed into the bite between the roll and block.

3,667,078

GOLF CLUB HOLDER

Joseph R. Distasio, 710 Shore Road, Spring Lake Heights, N.J.

Filed Feb. 19, 1971, Ser. No. 116,974
Int. Cl. A63b 57/00
U.S. Cl. 15—104.92 20 Claims

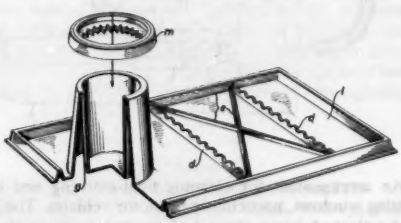
A golf club holder is adapted to be secured to or made a part of a golf bag and to carry a plurality of side-opening receptacles which face the interior of the bag and into which the heads of selected golf clubs can be inserted by means of a substantially lateral movement in the opposite direction. The receptacles are maintained in appropriate operative position by means of rods which extend up from a support and which are preferably adjustably vertically positionable, thereby to adapt individual receptacles to receive the heads of different specific golf clubs.

3,667,079

DEVICE FOR SCRAPING OFF AND COLLECTION OF MEDICAL REFUSE AND FOR PREVENTION OF ITS SPREAD

John Martin Hagglund, Valhallavagen 45A, Ornskoldsvik, Sweden

Filed Sept. 4, 1970, Ser. No. 69,832
Claims priority, application Sweden, Sept. 9, 1969, 12408/69
Int. Cl. A61g 15/00; B65f 7/00
U.S. Cl. 15—105 14 Claims



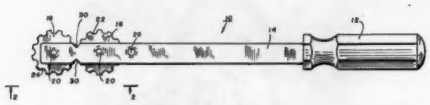
A scraping off and collecting device for medical refuse consisting of a collar with scraping means for scraping the refuse off medical instruments, and a throw-away beaker for collection of the refuse, the collar being made with stiffening projections at an angle to the plane of the collar. The bottom of the collar is punched out so that scraping teeth are formed.

3,667,080

FLUTE CLEANER FOR TWIST DRILLS

Henry Persson, 224 Glenwood Avenue, Bloomfield, N.J.

Filed Mar. 29, 1971, Ser. No. 128,740
Int. Cl. B23b *51/00*
U.S. Cl. 15—236 **6 Claims**



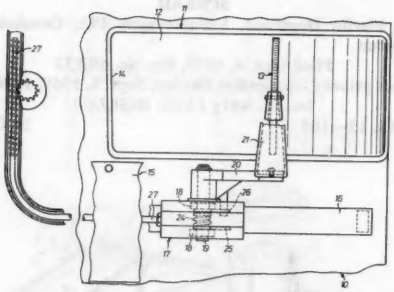
A hand-held flute cleaner for twist drills includes an arm member upon which is mounted a pair of cleaning discs which are freely rotatable around axles carried in the arm. The cleaning discs are preferably made of soft metal such as aluminum or may be of plastic. In the periphery of these discs are spaced cutouts disposed to enter and engage a sharp edge of the flute of the twist drill to scrape the accumulated material from the drill.

3,667,081

WINDOW-CLEANING ARRANGEMENT

Karl-Heinz Burger, Buehl, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 29, 1970, Ser. No. 85,146
Claims priority, application Germany, Nov. 3, 1969, P 19 55 127.0
Int. Cl. B60s *1/20*
U.S. Cl. 15—250.24 **10 Claims**



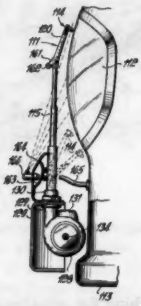
An arrangement for cleaning light-emitting and light-admitting windows, particularly of motor vehicles. The window to be cleaned has a general plane, two transversely spaced first marginal portions and a second marginal portion which connects the first marginal portions. A carriage is mounted for movement along the second marginal portion between the first marginal portion and carries a wiper arm assembly which moves with it and which is pivotably mounted on it for turning movement about an axis paralleling the general plane of the window. A wiper blade is mounted on the assembly and extends in at least substantial parallelism with the first marginal portions but is offset laterally with respect to the axis. Biasing means biases the assembly pivotably about the axis to maintain the wiper blade in contact with the window.

3,667,082

LIGHT FOR AUTOMOTIVE VEHICLES AND WIPER THEREFOR

Alfred Hoyler, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Original application Aug. 13, 1968, Ser. No. 752,204, now abandoned. Divided and this application Feb. 16, 1971, Ser. No. 115,785
Claims priority, application Germany, Sept. 2, 1967, B 94281; Oct. 19, 1967, B 95035
Int. Cl. B60s *1/06, 1/14, 1/20*
U.S. Cl. 15—250.02 **10 Claims**



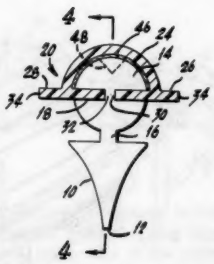
The headlights of an automotive vehicle are provided with wipers having elongated flexible wiping elements which are reciprocable along the outer sides of the respective lenses toward and away from a parking position in which they are concealed behind the moulding rings of the headlights. Sprinklers are provided to spray water onto the lenses, at least during a portion of reciprocatory movement of the wiping elements. The operation of the drives for the wiping elements and of pumps for the sprinklers is regulated by electric programming circuits.

3,667,083

WINDSHIELD WIPER ASSEMBLY

Roy E. Linker, Nursery Road, Titusville, N.J.

Filed Aug. 28, 1970, Ser. No. 67,916
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.42 **13 Claims**



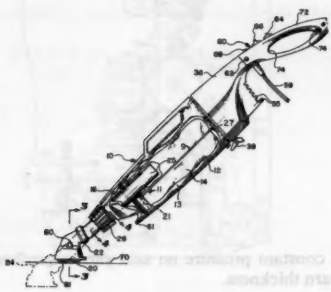
A windshield wiper assembly is provided with a wiper blade and a backing strip together with a blade retaining clip engaging the backing strip and connected to the blade to prevent movement of the blade with respect to the backing strip. For this purpose the clip preferably has a portion thereof located between the backing strip and blade and has prongs thereon which project into the material of which the blade is formed. The backing strip and/or the blade or both may b formed of extruded plastic material and in an alternative embodiment of the invention, the wiper blade has an electrical heating element carried thereby, whereas blade supporting members which are detachably connected to the backing strip form part of an electrical circuit including the heating element and blade retaining clip.

3,667,084

LIGHTWEIGHT VACUUM CLEANER

Bruno M. Valbona, Avon; Robert J. Emmons, Manchester, and Maurice P. Samuelian, West Hartford, all of Conn., assignors to Dynamics Corporation of America, New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,300
Int. Cl. A47l *9/00*
U.S. Cl. 15—323 13 Claims



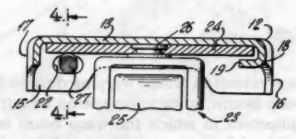
A portable lightweight vacuum cleaner having an extendable nozzle intake conduit rigidly supported by an easily adjustable resilient seal losing the lower end of a filter bag compartment into which the intake conduit projects to vary the distance between a fixed operating handle and the nozzle without changing the manageability and nozzle-floor orientation with users of different statures.

3,667,085

CASTER PAD

Charles Cumella, Bronx, and Joseph Cutrone, North Merick, both of N.Y., assignors to Federal Casters Corporation, Copiague, N.Y.

Filed May 21, 1970, Ser. No. 39,361
Int. Cl. B60b *33/00*
U.S. Cl. 16—30 8 Claims



A caster pad for mounting a caster or roller assembly to a container or receptacle or the like wherein the caster pad is provided at opposite ends thereof with means for removably supporting the caster assembly relative to the pad without the need for separate fasteners and the like.

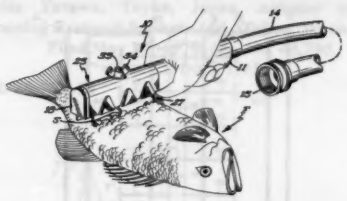
3,667,086

HAND TYPE FISH SCALING DEVICE

Paul A. Sexton, 235 Exeter Place, St. Paul, Minn.

Filed Jan. 18, 1971, Ser. No. 107,238
Int. Cl. A22c *25/02*
U.S. Cl. 17—66 8 Claims

A hand type fish scaling device is comprised of an elongate handle having a mounting member projecting from the forward end of the handle. The handle is hollow and is connected to one end of a flexible conduit, and the conduit is adapted to be connected to a faucet. A channel-shaped scaling blade and a channel-shaped hood are mounted on the mounting member so that a pair of passages are provided, through which water passes. Internal and external outlet ports are provided along the blade elements of the scaling blade so that the scaling blade is constantly washed during the scaling operation.

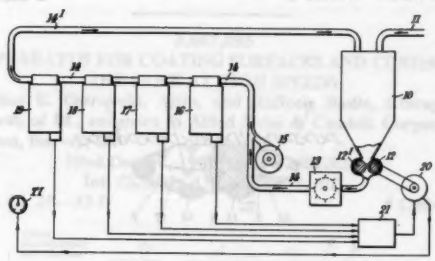


3,667,087

FEEDING OF FIBROUS MATERIALS TO TEXTILE CARDS

John Dakin, Rossendale, and John George Campbell, Baxenden, Accrington, both of England, assignors to T. M. M. (Research) Limited, Oldham, Lancashire, England

Filed Oct. 28, 1969, Ser. No. 871,859
Int. Cl. D01g *15/40*
U.S. Cl. 19—105 8 Claims



In a method of feeding fibrous material to a plurality of textile cards, the rate of feed of the fibrous material from a common feed means is automatically changed in response to a change in the production rate of one or more of the cards by an amount equal to or substantially equal to the change in production rate of the one or more cards. The automatic changing of the rate of feed of the fibrous material is controlled by control means responsive to the stopping or reduction in speed of a card and to the bringing of the card from the stopped or slow speed condition to normal operating speed.

3,667,088

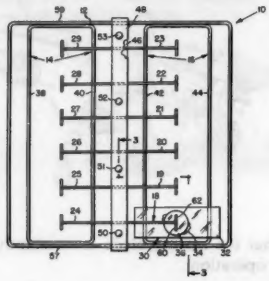
SLIDE HOLDER METHOD AND APPARATUS

Frank David Kurtz, 398 Five Points Road, Honeoye Falls, N.Y.

Filed Oct. 29, 1970, Ser. No. 85,000
Int. Cl. A44b *21/00*; G02b *21/34*
U.S. Cl. 24—81 PC 1 Claim

A method and apparatus for holding together a slide assembly composed of a slide, a slide preparation on a top surface thereof, and a cover slip overlying the slide preparation. The preferred slide holder of the present invention employs a base, a slide support mounted thereon, and a plurality of spring arms mounted on the base and biased toward the slide support. In operation, a spring arm is manually lifted up, a

slide assembly is placed between the raised spring arm and the sling support, and then the spring arm is allowed to come down on top of the cover slip, firmly holding the slide assembly together.



3,667,089

SLIDE FASTENER

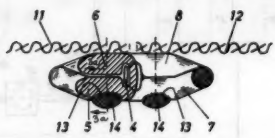
Hans Porepp, Am Rebberg, Wangen/Bodensee, Germany

Original application Oct. 27, 1966, Ser. No. 590,080, now Patent No. 3,461,486, dated Aug. 19, 1969. Divided and this application Feb. 10, 1969, Ser. No. 813,360

Claims priority, application Germany, Nov. 4, 1965, P 12 80 609.6

Int. Cl. A44b *19/12*

U.S. Cl. 24—205.13 C 2 Claims



Each half of a slide fastener having two halves adapted to be sewn onto a carrier ribbon has a plastic thread formed into a series of helical loops defining convolution portions. Each convolution portion is flattened only in a limited region of each loop that overlaps a loop in the other half of the slide fastener and to a width substantially twice the diameter of the thread. These flattened regions form coupling surfaces which serve to inter-engage with the coupling surfaces formed in the other half of the slide fastener. The flattened regions are sharply kinked and the convolution portions adjacent the flattened regions only are disposed in superposed relation contacting each other and merged opposite to the flattened surfaces into oppositely directed, exposed, smooth return bend portions.

3,667,090

APPARATUS FOR DEPHASING TEXTURED YARN

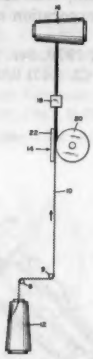
Charles P. Mazzone, Dover, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 57,737, July 23, 1970, Original application Mar. 27, 1968, Ser. No. 716,533, now Patent No. 3,546,744, dated Dec. 15, 1970. Divided and this application Sept. 9, 1970, Ser. No. 70,776

Int. Cl. D01b *3/04*

U.S. Cl. 28—1 CF 7 Claims

This invention relates to dephasing multifilament single end crimped yarn. The dephasing is carried out in an apparatus wherein the crimped yarn is passed between a plate and a rotatable roll which are mounted so as to exert a substantially constant pressure on said yarn regardless of variations in yarn thickness.



3,667,091

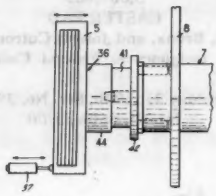
TEXTILE WARPING DEVICES

Robert Leger, Tourcoing, France, assignor to Societe Anonyme Dite Etablissements Cornard & Cie, Tourcoing, France

Filed Apr. 29, 1970, Ser. No. 32,935

Int. Cl. D02h *5/00*

U.S. Cl. 28—32 9 Claims



The invention relates to textile warping devices for winding yarns on to warp beams, suitable for use on weaving looms or on dyeing equipment in which the warp beam is driven by means of flexible drive means such as V-belts of rubber or the like, and in which the necessary movements are imparted to the mechanism exclusively by means of pneumatic devices which may be used for causing engagement of slide head members with the warp beam, the control of a presser roller, the control of a braking means and the operation of a comb. A warp beam may be fitted into the warping device by causing it to run up a ramp to bring spindles on the warp beam nearly into alignment with apertures in the slide head members which are then moved towards one another giving a slight further lift to the warp beam and bringing it clear of the ramps.

3,667,092

YARN PACKAGE WINDER

Walter Engels, Tryon, N.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

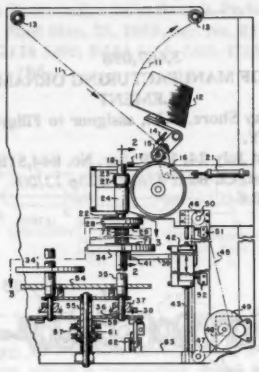
Filed June 22, 1970, Ser. No. 48,039

Int. Cl. B65h *54/00*, *54/76*

U.S. Cl. 28—21 11 Claims

Yarn winding apparatus including a yarn supply, rotatable yarn delivery means, means for conveying yarn from the

supply to the delivery means, rotatable yarn collecting means including a supporting base and a central core, the yarn



delivery means including a reference surface against which the core bears at the beginning of the winding cycle.

3,667,093

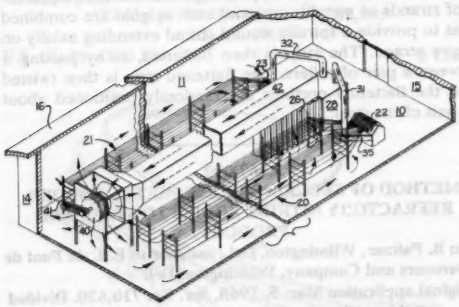
METHOD AND APPARATUS FOR CLEANING A TEXTILE CREEL AND WINDING APPARATUS

Clifford Culpepper, Jr., 1401 Ferncliff Road, Charlotte, N.C.

Filed Jan. 2, 1970, Ser. No. 161

Int. Cl. D02j *7/00*; B65h *49/00*

U.S. Cl. 28—55.3 **16 Claims**



An apparatus and method for removing waste material, such as lint and the like, from textile apparatus such as a yarn package supporting creel and a beam winding means spaced from the creel, which waste material is generated by the unwinding of a plurality of ends of yarn from packages in the creel, advancing of the yarn to the winding apparatus and rewinding of the yarn into a composite package and is normally moved toward the winding apparatus by the advancement of yarn, and wherein air is induced to flow about the textile apparatus and through a waste material collecting means with the air being directed to pass through the creel toward the winding means to impart additional impetus to the waste material being moved by advancement of the yarn and thereby ensure continued conveyance of waste material to the collecting means.

3,667,094

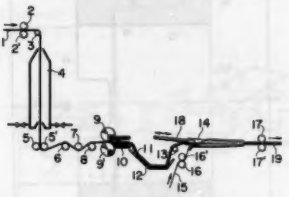
METHOD FOR HEAT-SETTING OF CRIMPS OF ARTIFICIAL FILAMENT TOWS

Masahide Yazawa, Toyko, Japan, assignor to Polymer Processing Research Institute Ltd., Tokyo, Japan

Filed May 27, 1970, Ser. No. 40,795

Int. Cl. D02g *1/12*

U.S. Cl. 28—72.14 **5 Claims**



The present invention provides a method of producing excellent crimped fibers, in which artificial fibers are subjected to mechanical crimping, enveloped in a crimped state in a wrapping under tension, and are passed through a high temperature pressurized saturated steam chamber at the annealing temperature of the fibers. The crimps are permanently fixed by the effect of moisture and heat under a lateral pressure. The resulting fibers, when made into an end product, have a high degree of crimp recovery upon reheating in the finishing process, even if the crimps have been straightened by processing in air before finishing operation.

3,667,095

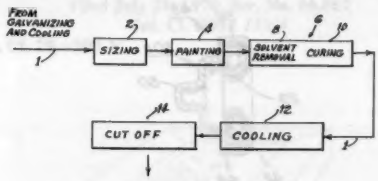
APPARATUS FOR COATING SURFACES AND CURING THE SAME AT HIGH SPEEDS

Arthur E. Ostrowski, Alsip, and Raffaele Basile, Chicago, both of Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Dec. 17, 1969, Ser. No. 885,824

Int. Cl. B23p *35/00*; B23k *31/02*

U.S. Cl. 29—33 D **5 Claims**



A machine for galvanizing and coating of steel tubing operating continuously to achieve high rates of production is provided with means for applying a protective film to a tube formed from strip steel and coated with zinc and includes means for removing the solvent from the film material and curing the material after the coating has been applied. The means includes a multistage heating apparatus to sequentially remove the solvent and cure the material.

3,667,096

ROLL DEVICE

Kurt G. Edsmar, Huddinge, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Continuation of application Ser. No. 760,459, Sept. 18, 1968, now abandoned. This application Nov. 4, 1970, Ser. No. 87,008

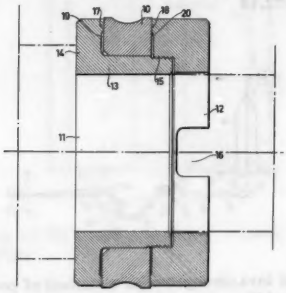
Claims priority, application Sweden, Sept. 18, 1967, 12795/67

Int. Cl. B21b *31/08*

U.S. Cl. 29—125 **5 Claims**

A roll, for rolling metals or for grinding, comprises (1) a roll ring formed of a metal carbide, on (2) a metallic holder

or support means, which latter means consists essentially in a flanged sleeve, on which the roll ring is disposed, with one side face of the same abutting against a peripheral part of the flange of the sleeve, and a co-operating flanged muff threaded onto the sleeve and having a peripheral part



abutting against the other side face of the roll ring. Said flanges are so profiled as to leave annular slits on either side of the roll ring, in which slits there is provided a suitable adhesive substance "glueing" the roll ring to the flanges of the support means.

3,667,097

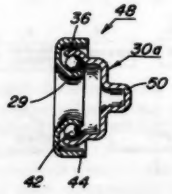
METHOD FOR MAKING A BALL BEARING

Albert G. Germann, North Caldwell, N.J., assignor to G & H Mechanical Laboratory, Inc., Township of Wayne, Passaic County, N.J.

Original application Nov. 4, 1970, Ser. No. 86,772, now Patent No. 3,633,982, dated Jan. 11, 1972. Divided and this application Nov. 9, 1971, Ser. No. 197,085

Int. Cl. B23p *11/00;* **F16c** *19/02*

U.S. Cl. 29—148.4 A **9 Claims**



There is disclosed a method for manufacturing a ball bearing in which the inner race members are made of sheet metal so as to provide a precision bearing of very low cost. The sheet metal ball bearing of this invention is contemplated to be made with three different styles of internal inner race members disposed to be attached to or used with office furniture, home appliances, conveyors, automotive devices and the like by three different means. Attachment of the bearings may be by spot welding, staking, spinning, bolting, riveting, in press fit seats and other conventional means. These ball bearings are commonly designated as unground cageless bearings wherein the balls are arranged in the raceway with the balls in substantially tangential circumferential engagement with each other so as to provide a bearing having a determined amount of play after the bearing is assembled. The manufacture of the ball bearings is with an "in line" assembly system or by a rotary table system. In either system the bearing components are carrier through several stations for assembly to a determined configuration. These bearings are contemplated as having an outer flange drawn to a determined diameter which is merely a matter of selection. Size change of this diameter is accomplished by changing of the dies for the production of an outer blank diameter and for drawing the flange to a determined outer diameter. These bearings have inner and outer members which are of sheet metal and after assembly the bearings may be case hardened.

3,667,098

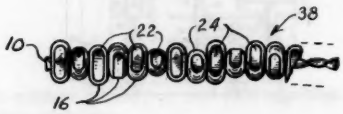
METHOD OF MANUFACTURING ORNAMENTAL ELEMENT

Eliezer Levy, Bay Shore, N.Y., assignor to Filigree Arts Inc., New York, N.Y.

Filed July 24, 1969, Ser. No. 844,518

Int. Cl. B21f *43/00;* **B23p** *13/00*

U.S. Cl. 29—160.6 **16 Claims**



An ornamental element for use as a decorative addition to jewelry comprises a strip of material having a plurality of parts integrally formed from the material, each of the parts having a surface exposed at the periphery of the strip. The surface of each part is characterized by a first portion of a given configuration and a second portion of different configuration. The second portions of the parts are randomly positioned about the axis of the integral strip to effect an irregular but attractive profile. The method of manufacturing the element comprises providing a strip of material having a plurality of parts proximately and adjacently arranged along the axis of the strip, compressing the parts to alter the configuration thereof and twisting the strip to rotatably position the altered portions randomly at different locations about the axis of the strip. In the most preferred embodiment, a plurality of strands of metallic material such as gold are combined so as to provide a spirally wound strand extending axially on a core strand. The strip is then flattened, as by passing it between a pair of rollers. The flattened strip is then twisted until the flattened portions are randomly positioned about the axis of the strip.

3,667,099

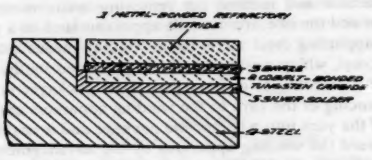
METHOD OF SECURING DENSE, METAL-BONDED REFRACTORY NITRIDE BODIES TO STEEL AND PRODUCT

Alan B. Palmer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original application Mar. 5, 1968, Ser. No. 710,620. Divided and this application July 31, 1970, Ser. No. 64,937

Int. Cl. B23p *3/20, 3/26*

U.S. Cl. 29—191 **13 Claims**



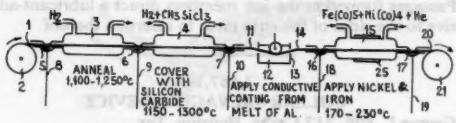
Dense, metal-bonded refractory nitride elements such as cutting edges are secured to metal supports such as steel tool shanks by metallurgically bonding between the two materials a dense, cobalt-bonded tungsten carbide connecting element having an expansion coefficient approximating that of the nitride element.

3,667,100

METHOD OF MANUFACTURING COMPOSITE WIRE PRODUCTS HAVING A TUNGSTEN CORE AND A MAGNETIC COVERING

Michel Marchal, Palaiseau, and Jean Bouygues, Fontenay-Aux-Roses, both of France, assignors to Compagnie Francaise Thomson Houston-Hotchkiss Brandt, Paris, France

Filed Mar. 25, 1969, Ser. No. 811,281
Int. Cl. G11b 5/66; B44d 1/16, 1/06; C23c 11/08, 11/02
U.S. Cl. 29—195 10 Claims


ANNEAL 1,100-1,250°c
COVER WITH SILICON CARBIDE 1150 - 1300°c
APPLY CONDUCTIVE COATING FROM MELT OF AL.
APPLY NICKEL & IRON 170 - 230°c

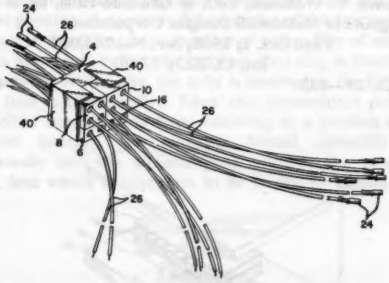
A tungsten wire core is covered with a sheath of silicon carbide, over which a conductive metal coating is applied such as aluminum, nickel or the like which wets, but does not chemically react with the silicon carbide; a magnetic nickel-iron compound is then applied over the metal coating, the metal coating providing a good conductive surface beneath the magnetic cover. The resultant composite wire core has an average tensile strength of 220 kg/mm² and a modulus of elasticity of 40,000 kg/mm².

3,667,101

IMPROVED CONNECTORS AND GUIDE MEANS FOR ELECTRICAL HARNESS MAKING

James Albert Kloth, St. Petersburg, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 13, 1970, Ser. No. 27,585
Int. Cl. H01r
U.S. Cl. 29—203 HC 8 Claims



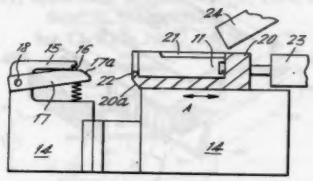
Electrical harness is manufactured by positioning connector housings in back-to-back relationship, inserting wires through the aligned cavities in the housings until the housings are on an intermediate portion of the wires, applying electrical terminals to the ends of the wires, and moving the housings axially along the wires until the terminals are contained in the cavities. In accordance with alternative embodiment, the wires are inserted through cavities in a separate guide member prior to application of terminals and insertion of terminals into housing cavities. Guide is removed from wires after insertion of wires into housing cavities.

3,667,102

APPARATUS FOR APPLYING INSULATING HOUSINGS TO ELECTRICAL CONNECTORS

Gilbert Auguste Guillemette, and Michel Jean Delorme, both of Val D'Oise, France, assignors to AMP Incorporated, Harrisburg, Pa.

Filed July 7, 1970, Ser. No. 52,907
Claims priority, application France, July 11, 1969, 6923903
Int. Cl. H05k 13/00
U.S. Cl. 29—203 6 Claims



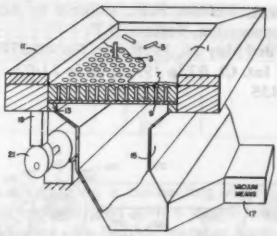
An apparatus for applying insulating housings to electrical connectors comprises first means for releasably retaining an insulating housing; second means for releasably retaining an electrical connector for insertion and retention in the housing; and third means for effecting relative reciprocal movement between the first means and the second means towards and away from each other, the connector being inserted into the housing as the first means and the second means move towards each other, and being retained in the housing and released from the second means as the first means and the second means move away from each other.

3,667,103

APPARATUS FOR INSERTING TERMINALS IN AN APERTURED PLATE

Edwyn H. Petree, Burlington, N.C., assignor to The United States of America as represented by the Secretary of the Army

Filed July 21, 1970, Ser. No. 56,867
Int. Cl. H05k 13/04
U.S. Cl. 29—203 V 2 Claims

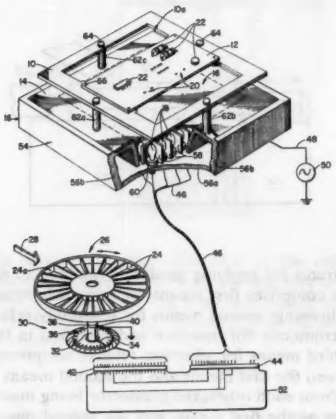


An apparatus for inserting terminals into a logic plate having a grid of apertures to enclose the terminals including a screen adjacent the lower side of the plate to prevent the terminals from falling through the plate. The plate and screen are supported on a frame that is connected to a means for vibrating the frame. A means is connected beneath the screen for causing a greater atmospheric pressure above the plate than below it. As the frame is rapidly vibrated with sufficient amplitude to cause the terminals to stand on their ends, a vacuum means is applied beneath the plate to assist in drawing the terminals into the apertures.

3,667,104
POSITION LOCATING APPARATUS EMPLOYING MULTIPLE PROJECTING LAMPS

George W. Chamillard, East Bridgewater, and David M. Winsor, North Attelboro, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

Filed July 2, 1970, Ser. No. 51,842
Int. Cl. H05k 13/04; B23q 17/00
U.S. Cl. 29—203 B 6 Claims

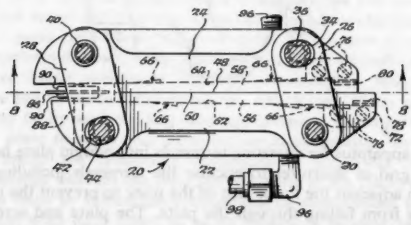


Position-locating apparatus projects light from an array of lamp devices onto one or more selected locations on a support member to indicate automatically that a correspondingly-selected device is to be positioned at each illuminated location, typically for assembly onto the support member. The designation of the selected device lights a selected lamp element of the array for illuminating each position through an optical mask. Each lamp projects light over an area on the support member that partially overlaps the area which one or more other lamp elements can illuminate, but only a single lamp illuminates windows in a single unique portion of the mask.

3,667,105
STRIP INSERTING APPARATUS

James F. Sharpe, Buffalo, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed May 26, 1970, Ser. No. 40,570
Int. Cl. B23p 19/02; E01c 23/02
U.S. Cl. 29—235 16 Claims

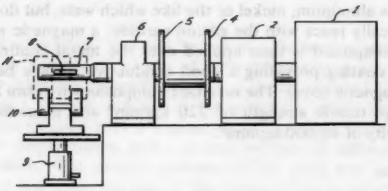


A strip inserting apparatus comprising a pair of elongated jaw members extending in a side-by-side relation and connected together for relative axial movement by a pair of links pivotably mounted adjacent opposite ends of the jaw members to form a parallelogram linkage. A longitudinally and downwardly tapered groove is provided in the apparatus for progressively inserting a strip of material into a slot. The groove is defined by laterally spaced gripping surfaces on the jaw members, which surfaces are tapered rearwardly of the apparatus in a converging relation and a pair of downwardly inclined surfaces extending inwardly of the respective gripping surfaces. Anti-friction rollers can be provided on the jaw members to facilitate relative movement between the jaw members and the strip. At least one insert wheel is journaled on the rearward portion of the apparatus to insert the strip to the desired depth. An actuator connected to the jaw members moves the jaw members alternately in an axial direction along the strip. A vibrator is mounted on the jaw members below the actuator for facilitating insertion of the strip. Passages formed in the jaw members direct a lubricant-adhesive to the sides of the strip prior to insertion thereof.

3,667,106
COLLAR SALVAGING DEVICE

George L. Hill, 717 Carby, Houston, Tex.

Filed July 30, 1969, Ser. No. 856,229
Int. Cl. B23p 19/04
U.S. Cl. 29—240 3 Claims

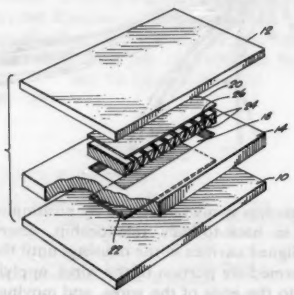


A tool for salvaging collars from pipe having means for gripping the collar and rotating the pipe within the collar to break the connection and effect removal of the collar therefrom, including the novel process of cooling the collar while blocks are welded within the pipe and adapting the device employed for rotating the pipe to the various sizes of pipe.

3,667,107
FILLER FOR ROLL-WELD STRUCTURES

Raymond H. Anderson, Jr., Santa Ana; Richard A. Rawe, and Bennett V. Whiteson, both of Granada Hills, all of Calif., assignors to McDonnell Douglas Corporation

Filed Oct. 1, 1968, Ser. No. 764,064
Int. Cl. B23p 17/00
U.S. Cl. 29—423 2 Claims



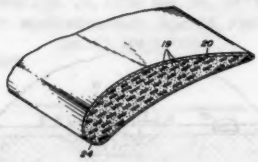
A roll-welding process for fabricating beryllium roll-welded panels where the filler material is an austenitic manganese or Hadfield steel which can be chemically or mechanically removed from the structure that has been diffusion bonded by the process.

3,667,108

METHOD OF MAKING A BERYLLIUM TITANIUM COMPOSITE

Richard Schmidt, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 17, 1970, Ser. No. 29,597
Int. Cl. B23k 31/02
U.S. Cl. 29—480 5 Claims



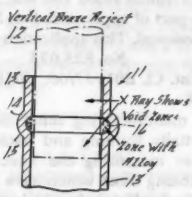
A method of making a beryllium reinforced titanium turbine blade. The method utilizes a preform composed of beryllium rods within a titanium structure. The preform is formed into intricate blading shapes by isothermal forging techniques.

3,667,109

VERTICAL BRAZING SYSTEM

James E. Alcenius, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Apr. 20, 1970, Ser. No. 29,909
Int. Cl. B23k 31/02
U.S. Cl. 29—490 7 Claims



A system for brazing together a fitting and tube while in a vertical position. A portion of the interior of the brazing alloy reservoir in the fitting is contaminated with a film of material such as aluminum before the brazing alloy ring is inserted in the reservoir. At the site, the tube is inserted in the fitting to which heat is then applied. Since the contaminant prevents the melted brazing alloy from adhering to a portion of the reservoir interior, the alloy is forced upwardly and downwardly into the annular gaps between the tube and fitting, into which it continues to be drawn by capillary action.

3,667,110

BONDING METALS WITHOUT BRAZING ALLOYS

Childress B. Gwyn, Jr., Wethersfield, Conn., assignor to Contacts Incorporated, Wethersfield, Conn.

Filed Nov. 3, 1969, Ser. No. 873,721
Int. Cl. B23k 31/02, 35/38
U.S. Cl. 29—494 18 Claims

Excellent bonds between usually-brazed metals are obtained, without brazing or soldering alloys, by initially oxidizing the surfaces to be bonded and then bonding in a reducing atmosphere at a temperature below the melting point of either metal. If the metals form a eutectic, bonding will be carried out above the eutectic temperature. It is believed that the oxidation-reduction cycle produces a perfectly clean or nascent surface which facilitates bonding. Yields are improved by initially providing a very thin plated coating of silver, copper or nickel, or combinations thereof, on one workpiece.

3,667,111

PROCESS FOR FLUXING AND BRAZING PARTS MADE OF ALUMINIUM OR ALUMINIUM ALLOY

Andre Chartet, Meudon, France, assignor to Societe Anonyme Des Usines Chausson, Asnieres, France

Filed Mar. 2, 1970, Ser. No. 15,601
Claims priority, application France, Mar. 5, 1969, 6906108; Sept. 12, 1969, 6931230
Int. Cl. B23k 31/02, 35/36
U.S. Cl. 29—495 6 Claims

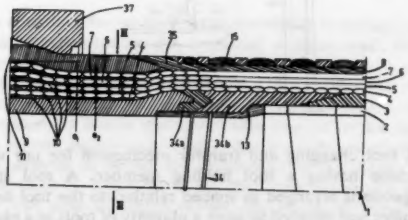
The process is characterized in that one proceeds to prepare a fluxing compound, in that a thin coat of this compound is deposited on at least those of portions of parts requiring to be assembled, then that after partly melting the compound the parts are heated up to brazing temperature.

3,667,112

PROCESS FOR MAKING COUPLINGS OF REDUCED SIZE AND CAPABLE OF TRANSMITTING HIGH MECHANICAL STRESSES BETWEEN AN ARMORED FLEXIBLE MEMBER AND A RIGID ELEMENT

Andre Chevalier, Pantin; Pierre Grolet, Viroflay, and Remi Reynard, Montesson, all of France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed Apr. 2, 1970, Ser. No. 25,118
Claims priority, application France, Apr. 3, 1969, 6910365
Int. Cl. B21d 39/00; B23p 11/02
U.S. Cl. 29—508 5 Claims



A process for making a connecting element, made of a hard material and provided with a jagged external wall, integral with one end of a flexible member having at least one armoring consisting of metallic wires, comprising the steps of covering said connecting element with an anchoring sleeve made of a material of lower hardness than that of the material constituting the armoring and said element, laying the armoring onto said anchoring ring, covering the armoring with a compression sleeve of lower hardness than that of the armoring and drawing the assembly of the connecting element, the armoring and said compression ring through a die, thereby producing through a great reduction in the diameter of said compression ring, a penetration of said armoring into said anchoring ring and into said compression ring and at the same time an inlaying of the material forming said anchoring ring between the jags of said jagged external wall of the connecting element.

3,667,113

KNITTING MACHINE NEEDLE BED

Morris Philip, 2519 Grand Avenue, Bronx, N.Y.

Filed Apr. 17, 1970, Ser. No. 29,472
Int. Cl. B23p 25/00
U.S. Cl. 29—527.6 13 Claims

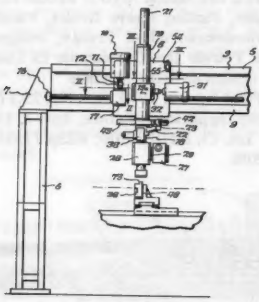
A knitting machine needle bed is provided with a hard wear surface by removing metal in the areas subjected to heavy wear, introducing hard material in such areas, and grinding the hardened material down to the proper level. The hard material is deposited in particulate, liquid or vapor form and becomes substantially integral with the base. If combining teeth are to be inserted, the hard material is ground away in the appropriate areas, which are then slotted for the insertion of the combining teeth.

3,667,114

TOOL CHANGING AND TRANSFER MECHANISM

Edwin R. Smith, Seneca Falls, and Constantine F. Cafolla, Waterloo, both of N.Y., assignors to SFM Corporation, Union, N.J.

Filed Oct. 2, 1969, Ser. No. 863,234
Int. Cl. B23q 3/155
U.S. Cl. 29—568 10 Claims



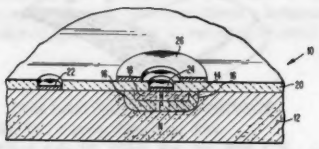
A tool changing and transfer mechanism for use with a machine having a tool holding member. A tool storage magazine is arranged in spaced relation to the tool holding member and adapted to store a plurality of tools in a plurality of storage positions. The mechanism includes a tool changer comprising a carrier having plural tool engaging devices for simultaneously carrying a used tool being returned and a new tool to be used. The changer is moved between the storage magazine and machine tool holder by controlled drive means, and the carrier is moved through a path adjacent the magazine storage positions by drive means controlled by sensing means movable with the carrier and engageable with locating stops associated with the storage positions and selectively actuated by a control circuit including a stepping relay and selector switches. The carrier is extended and retracted along a first axis for insertion and removal of a tool, rotated about a second axis intersecting the first axis for alternative positioning of the tool engaging devices, and rotated about a third to orient it one way for removing and replacing tools relative to the magazine and another way for removing and inserting tools relative to the machine tool holding member.

3,667,115

FABRICATION OF SEMICONDUCTOR DEVICES WITH CUP-SHAPED REGIONS

Fred Barson, Wappingers Falls, and Herbert S. Lehman, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original application Jan. 30, 1965, Ser. No. 468,235, now Patent No. 3,461,360. Divided and this application May 12, 1969, Ser. No. 823,876
Int. Cl. B01j 17/00; H01g 13/00
U.S. Cl. 29—571 8 Claims



A method for forming a semiconductor device having a substantially cup-shaped region of one conductivity type between two regions of opposite conductivity type to preferably form a field effect transistor device. The region may be formed through one opening in an insulating layer located upon the surface of the device. Two successive diffusion operations of opposite conductivity types made through this same opening in the insulating layer forms the cup-shaped region to the desired thickness.

3,667,116

METHOD OF MANUFACTURING ZENER DIODES HAVING IMPROVED CHARACTERISTICS

Avio Di Felice, 43 Mount Hood Terrace, Melrose, Mass.

Continuation-in-part of application Ser. No. 539,753, Apr. 4, 1966, now abandoned. This application May 15, 1969, Ser. No. 825,025
Int. Cl. B01j 17/00; H01l 7/00
U.S. Cl. 29—574 3 Claims

A method of manufacturing zener diodes comprising the steps of sequentially forming and packaging a plurality of diodes, thereafter measuring the knee impedances of the diodes and irradiating those which have knee impedances exceeding a specified value with a high energy electron beam approximating the energy levels of beta radiation.

3,667,117

ELECTROLUMINESCENT DIODE CONFIGURATION AND METHOD OF FORMING THE SAME

Hans J. Kunz, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 28, 1969, Ser. No. 803,216
Int. Cl. B01j 17/00; H01l 7/00
U.S. Cl. 29—576 7 Claims

An electroluminescent diode which includes an electromagnetic radiation emitting PN junction formed by diffusing, into both surfaces of a semiconductor slice of a first conductivity, a dopant material of opposite type conductivity. Contact metallizations are mounted within windows in an insulating barrier which covers said diode so as to form electrical contacts engaging both the N and P type areas of the diode. An annular reflector metallization pad is mounted on the surface of the device over the PN junction and spaced

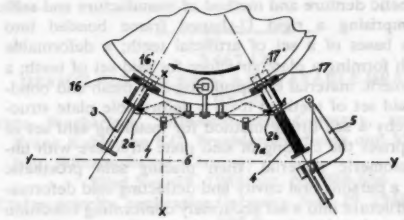
from one surface of the semiconductor material by the insulating coating so as to reflect light out through the surface opposite to that on which an anti-reflection coating has been placed.

3,667,118

METHOD AND APPARATUS FOR FINISHING ELECTRIC COILS

Giuseppe Camardella, Via E, Biondi 1, 20154 Milan, Italy

Filed Apr. 20, 1970, Ser. No. 29,798
Claims priority, application Italy, Apr. 26, 1969, 16088 A/69
Int. Cl. H01f 7/06
U.S. Cl. 29—605 **9 Claims**



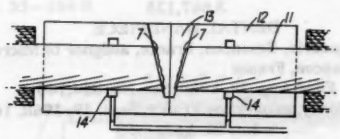
In a method and apparatus for winding and finishing electric coils in which the coils are intermittently advanced by a turret through a plurality of working stations including at least one winding station and in which the coils remain interconnected by a length of wire extending from the winding station to the next station or to all the other working stations, the improvement wherein the wire is wrapped around the terminal lug of the spool in the winding station, and preferably simultaneously also in the subsequent station, by engaging the mentioned length of wire and rotating same to cause it to describe a conical surface which embraces the lug and has its apex at the base of the lug.

3,667,119

METHOD OF JOINTING AND TERMINATING ELECTRIC CABLES

John Stephen Cleaver, Faversham; Peter Guilford, Erith; Frederick James Kimpton, Bexleyheath, Kent; Thomas John Page, Beckenham, Kent, and Norman Richard Steinberg, Dolphin Square, South Wales, all of England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Apr. 4, 1969, Ser. No. 813,621
Claims priority, application Great Britain, Apr. 11, 1968, 17,484/68; June 10, 1968, 27,499/68; 27,500/68; Nov. 11, 1968, 53,371/68; 53,372/68
Int. Cl. H01r 43/00
U.S. Cl. 29—628 R **20 Claims**



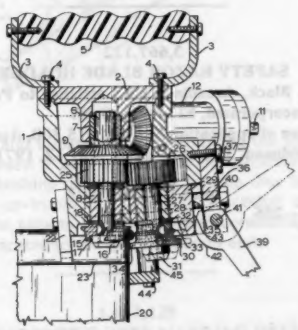
Electric cables having at least one conductor in the form of a strand through the interstices of which liquid impregnant for the cable dielectric can pass are jointed or terminated by forming a heat sink surrounding the end of the stranded conductor and bonding the stranded conductor to a terminal or to another conductor by the application in the molten state of an adherent body of metal to substantially the whole of the cut end face of the stranded conductor or between the cut end face of the stranded conductor and the end of the terminal or of the other conductor. During bonding, liquid impregnant is removed from the interstices between the wires of the stranded conductor in the region of a cut end thereof by applying vacuum to the stranded conductor. The bonding process is preferably a welding process, suitably MIG welding, comprising a first stage in which the end of the stranded conductor is sealed by a layer of weld metal and a second stage in which the connection is completed.

3,667,120

APPARATUS FOR REMOVING THE TOPS OF CONTAINERS

William F. Krist, N106 W20997 Park Hill Lane, Germantown, Wis.

Filed Feb. 10, 1970, Ser. No. 10,259
Int. Cl. B67b 7/32, 7/38
U.S. Cl. 30—15.5 **7 Claims**



An apparatus for opening metal containers including a casing to be supported on the container. A drive shaft, driven either through a manual crank or an electric motor, is journalled within the casing and carries a drive roller that rides against the inner edge of the chime on the container. A slide is mounted for lateral movement with respect to the casing and a second shaft is journalled within the slide and carries a cutter adapted to engage the outer edge of the chime. The second shaft is driven from the first shaft through a gear drive. The slide is moved toward the casing to bring the cutter into engagement with the chime by a lever arm which is pivoted to the casing and acts against the outer end of the slide.

3,667,121

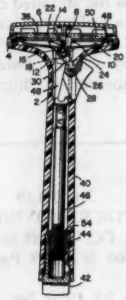
SAFETY RAZOR

Francis W. Dorion, Jr., Hingham; Warren I. Nissen, Topsfield, and Roger L. Perry, Lynnefield Center, all of Mass., assignors to The Gillette Company, Boston, Mass.

Filed July 10, 1970, Ser. No. 53,880
Int. Cl. B26b 21/32
U.S. Cl. 30—60 **4 Claims**

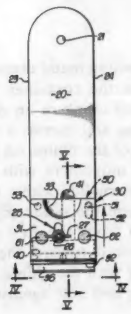
A safety razor including a head portion having a cap member mounted thereon and adapted to pivot upon one end of the razor head, the cap being held and released by a

hook latch means disposed in the razor head. The razor further includes a handle portion in which are mounted



means for adjusting the exposure of the cutting edge of a razor blade retained by the head portion.

3,667,122
SAFETY RAZOR BLADE HOLDER
Leonard J. Black, Arcadia, Calif., assignor to Pacific Handy Cutter, Incorporated, El Monte, Calif.
Continuation of application Ser. No. 815,300, Apr. 11, 1969, now abandoned. This application May 12, 1971, Ser. No. 142,792
Int. Cl. B26b *29/02*
U.S. Cl. 30—286 **9 Claims**

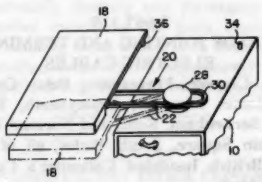


A safety razor blade holder comprising a longitudinally extending handle, a threaded stud carried by the handle, a guard member slidably mounted on the stud, a lock nut for clamping the guard member and handle together, a safety razor blade, and means for permitting the guard member to be positioned relative to the safety razor blade when such blade is in an operative position so as to expose or temporarily shield the edge of such blade and preventing movement of the guard member, even when the lock nut is slightly loosened, from allowing the edge of the blade to be exposed when such blade is in a second position.

3,667,123
DENTURE AND METHOD
Elbert P. Huey, Scottsdale, Ariz., assignor to Comfo-Dent Corporation
Filed July 31, 1970, Ser. No. 59,922
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **2 Claims**

A prosthetic denture and method of manufacture and self-fitting comprising a rigid U-shaped frame bonded into notches in bases of a set of artificial teeth; a deformable metal mesh forming a plate structure for said set of teeth; a soft elastomeric material encapsulating said mesh and bonding it to said set of teeth to form a deformable plate structure, whereby a self-fitting method for installing said set of teeth comprises the coating of said plate structure with uncured elastomeric material, then placing said prosthetic denture in a persons oral cavity and deflecting said deformable plate structure into a set accurately conforming condition with an edentulus ridge in said cavity and allowing said last-mentioned elastomeric material to cure in said accurately conforming condition.

3,667,124
DENTAL TRAY AND SUPPORT
Walter P. La Force, Penfield, and Glen A. Woodhams, Rochester, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Oct. 29, 1970, Ser. No. 84,975
Int. Cl. A61c *11/00*
U.S. Cl. 32—22 **2 Claims**



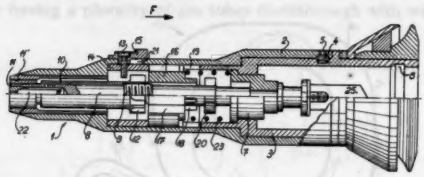
Disclosed is a dental tray support mounted on a single link member which can be rotated or translated in a horizontal plane, the tray support, when not in use, fitting flush with the top of an existing dental cabinet so that the tray support appears to be the top of the cabinet.

3,667,125
DENTAL HANDPIECE
Michel Seigneurin, Besancon, France, assignor to Micro-Mega S.A., Besancon, France
Filed Aug. 29, 1969, Ser. No. 854,140
Claims priority, application France, Sept. 19, 1968, 166708
Int. Cl. A61c *1/08*
U.S. Cl. 32—26 **9 Claims**

An improved micromotor-driven dental handpiece consists of a cylindrical body which includes an inner sleeve and an outer sleeve slidingly fitting over the inner sleeve, the two sleeves being maintained axially relative to each other.

A detent slidingly mounted on the outer sleeve releasably interconnects it with a gripper-locking sleeve and concurrently actuates a mechanism by means of which the shaft of

the handpiece may be intercoupled with the inner sleeve, whereupon the locking or releasing of the cutting tool is effected by turning the outer and inner sleeve relatively to each other.

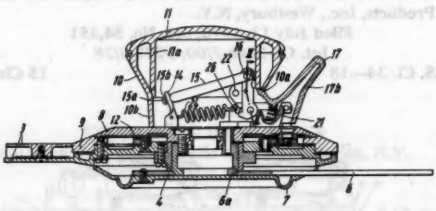


3,667,126

DEVICE FOR LOCKING A ROTATABLE DRAWING HEAD

Otto Wackerfuss, Wilhelmshaven, Germany, assignor to Franz Kuhlmann KG, Prazisionsmechanik und Maschinenbau, Wilhelmshaven, Germany

Filed Nov. 28, 1969, Ser. No. 880,686
Claims priority, application Germany, Nov. 29, 1968, P 18 11 805.3
Int. Cl. B43l *13/08*
U.S. Cl. 33—79 R **8 Claims**



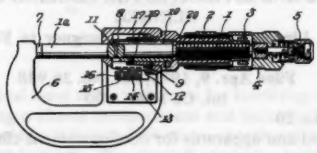
A single operating lever control for locking and unlocking a rotatable head on a drafting machine wherein a lock pawl is released from engagement with the teeth of a ratchet disc. A thumb operated lever extends along the side of the conventional hand knob and may be operated in one of two ways. Upon direct inward movement, the pawl is released only so long as the thumb lever is held. In the other mode of operation, the thumb lever is locked so that the lock pawl is retained out of ratchet disc engagement.

3,667,127

DIGITAL MICROMETER CALIPER

Taisuke Tsugami, 1-415 Shimoochiai, Shinjuku-ku, Tokyo, Japan

Filed June 4, 1970, Ser. No. 43,478
Int. Cl. G01b *3/18*
U.S. Cl. 33—164 R **4 Claims**



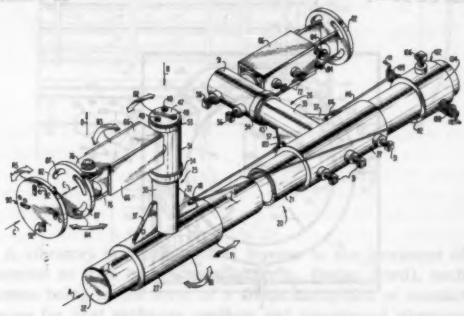
Improvements in structure of micrometer calipers of the digital type, designed to prevent ingress of any foreign matter into the interior mechanism of the caliper and to enable the digital counter incorporated to be readily zero-adjusted as required. The component parts of the caliper, particularly of the counter mechanism, can be assembled without particular skill and the caliper service life is substantially extended with reduced maintenance.

3,667,128

METHOD AND APPARATUS FOR CONNECTING PIPELINES

William A. Morgan, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed June 23, 1969, Ser. No. 835,647
Int. Cl. G01b *3/38*
U.S. Cl. 33—180 R **17 Claims**



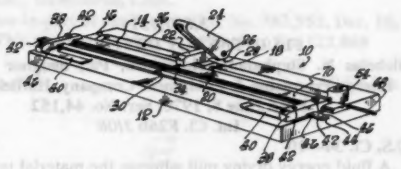
A method and apparatus for determining the spatial relationship between a pair of adjacent but separated conduit ends, re-establishing the spatial relationship thus determined at a remote environment, fashioning a conduit connecting segment at the remote environment and connecting the conduit thus fabricated to the spaced conduit ends.

3,667,129

ORTHODONTIST WIRE MARKING DEVICE

Thomas E. Aspel, P.O. Box 251, Bonsall, Calif.

Filed Jan. 28, 1970, Ser. No. 6,453
Int. Cl. A61c *7/00, 19/04*
U.S. Cl. 33—189 **3 Claims**



This invention is a device for use by orthodontists to mark arch wires used in orthodontic work wherein the device employ a means for transcribing the measurements made by orthodontists onto a wire in a permanent fashion so that the orthodontist may then correctly shape and use the marks as guides for placement of specific bend, such as loops, or for placement of attachments such as hooks on the arch wire used in orthodontic work. The device includes a means for clamping the unformed wire in position and means for aligning measurements and impressing permanent markings upon the wire in such manner that they may be readily identified. A cam-like marking device and indicating needle are worked cooperatively for this purpose.

3,667,130

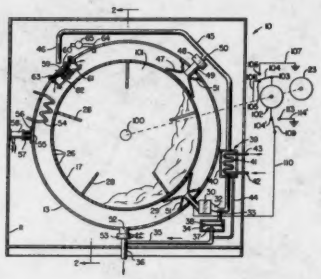
LIQUID REMOVING APPARATUS AND METHOD

Robert R. Candor, 5940 Munzer Road, Miami Township, Ohio, and James T. Candor, 5440 Cynthia Lane, Washington Township, Ohio

Continuation-in-part of application Ser. No. 696,639, Jan. 9, 1968, which is a continuation-in-part of application Ser. No. 639,354, May 18, 1967, now Patent No. 3,405,452, which is a continuation-in-part of application Ser. No. 532,266, Mar. 7, 1966, now Patent No. 3,330,136, which is a continuation-in-part of application Ser. No. 219,587, Aug. 27, 1962, now Patent No. 3,238,750, and a continuation-in-part of 748,298, July 29, 1968, and 769,155, Oct. 21, 1968, and 807,539, Mar. 17, 1969. This application July 7, 1969, Ser. No. 842,807. The portion of the term of the patent subsequent to Oct. 15, 1985, has been disclaimed.

Int. Cl. B01k 5/00

U.S. Cl. 34—1 22 Claims



This disclosure relates to a laundry apparatus, paper making apparatus or the like wherein the moisture or liquid in the wet laundry, food materials, paper slurry or the like, disposed therein is removed by an electrostatic means that provides a differential in the potential of the moisture in the laundry, food materials, paper slurry or the like and an electrode means for the moisture to tend to cause the moisture to leave the laundry, food materials, paper slurry or the like and move toward the electrode means. Such electrode means can comprise a suction nozzle which tends to draw a large volume of air through the laundry, food materials, paper slurry or the like adjacent thereto to also tend to direct the moisture from the laundry, food materials, paper slurry or the like toward the electrode means.

3,667,131

FLUID ENERGY DRYING MILL

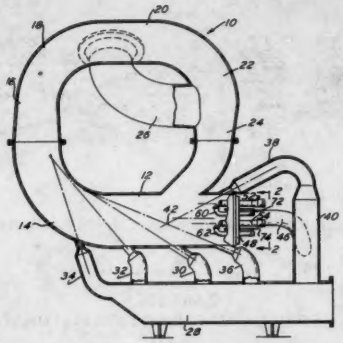
Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Company, Hatfield, Pa.

Filed June 8, 1970, Ser. No. 44,152

Int. Cl. F26b 3/08

U.S. Cl. 34—10 4 Claims

A fluid energy drying mill wherein the material to be dried is a liquid slurry of solid particles or of solids in solution. The slurry, upon being fed into the mill is immediately atomized and flash-dried, the atomization being accomplished by high pressure, high velocity gaseous fluid jets, while the flash-drying is effected by very hot, low pressure, gaseous fluid jets. The hot gaseous fluid jets comprise a plurality of gaseous fluid streams which enter from at least four different sides surrounding the feed inlet and converge at a focal point downstream of the inlet whereby the hot gaseous fluid both encompasses the fed material and concentrates its heat energy in the path of the fed material. The flash-dried particles are then centrifugally passed through the curved portion of the mill and centrifugally exhausted from the mill during their passage. Optionally, by-pass ducts may be provided between the downstack portion of the mill and the inlet chamber where atomization and flash-drying takes place whereby vapors from the downstack are used to break any



vacuum in the inlet chamber and may also be used as a tempering means to avoid case hardening of the particles.

3,667,132

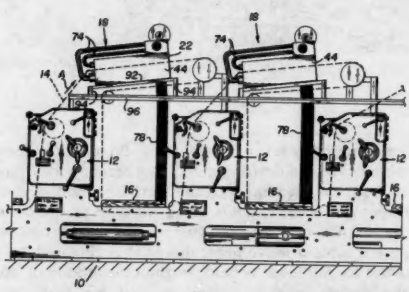
WEB DRIER AND METHOD OF TREATING A WEB IN CONTINUOUS SHEET PRINTING MACHINES

William C. Herbert, Jr., Mill Neck, N.Y., assignor to Herbert Products, Inc., Westbury, N.Y.

Filed July 13, 1970, Ser. No. 54,451

Int. Cl. F26b 7/00; F27b 9/28

U.S. Cl. 34—18 15 Claims



A web drier positionable between either the upper or lower runs of the relatively spaced web treating units of continuous sheet printing machines with the web drier having web heaters to dry the web and air appliers to break solvent laden fumes free of the web while air withdrawal means withdraw the applied air, and a method of treating the web to dry the same.

3,667,133

METHOD AND APPARATUS FOR COOLING CEMENT CLINKER

Roland L. Lincoln, Macungie, Pa., assignor to Fuller Company

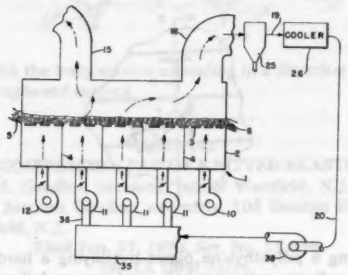
Filed Apr. 9, 1970, Ser. No. 26,958

Int. Cl. F26b 5/00

U.S. Cl. 34—20 11 Claims

A method and apparatus for cooling cement clinker which includes a conventional clinker cooler wherein clinker to be cooled is supported on a grate and moved from a kiln through the cooler and cooling air is blown through and around the clinker. The air is heated and entrains solids from

the hot clinker. Some of the hot air is returned to the kiln and the rest of it is directed to a dust collector and then to an air cooler. From the air cooler, the air is recirculated to be blown through a new supply of hot clinker. The cooler is a tank having a plurality of gas tubes therethrough with water



filling the tank and surrounding the tubes. The disclosure also sets forth that hot air may leave the clinker cooler, go directly to the air cooler and then to a conventional bag filter where clean air is exhausted to atmosphere. In this instance, ambient air is blown through the hot clinker.

3,667,134

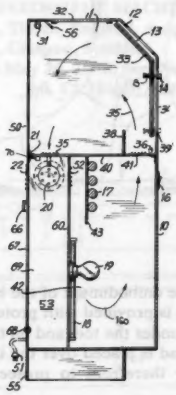
STERILIZING HAND DRYER

Thomas Rockson, 1920 Railroad Avenue, Holbrook, N.Y.

Filed Sept. 14, 1970, Ser. No. 71,985

Int. Cl. F26b *19/00*

U.S. Cl. 34—60 **9 Claims**



An electrical hand dryer apparatus for sterilizing the user's hands, having a closed compartment and including a blower for recirculating a volume of air past a chamber in which the user inserts his hands. The drying apparatus includes germicidal lamps for sterilizing the air and a means for heating the air while it is being recirculated. The apparatus also includes moisture absorbing rods for drying the air.

3,667,135

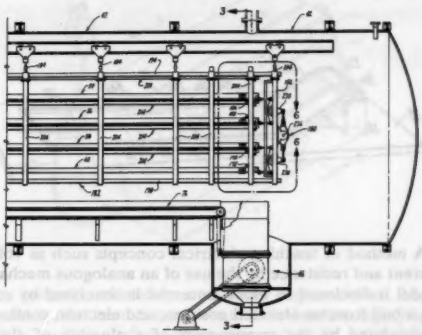
VIBRATORY CONVEYOR SYSTEM

Lorne A. Rowell, Lachine, Quebec, Canada, assignor to John T. Horton, Hinsdale, Ill.

Continuation-in-part of application Ser. No. 9,102, Feb. 9, 1970, which is a continuation of application Ser. No. 772,944, Nov. 24, 1968, now abandoned. This application Dec. 24, 1970, Ser. No. 101,343

Int. Cl. F26b *13/10*

U.S. Cl. 34—92 **7 Claims**



A vibratory conveyor system for use in the treatment of material as it is being conveyed (e.g., freeze dried), such system being in the form of a frame composed of conduit means for heat exchange medium and superposed vibratory conveying decks having conduit means for the heat exchange fluid below the surface thereof. In a specific system, four superposed conveying decks are mounted on springs and driven from a common drive shaft via eccentrics and rockers so that the vertical and horizontal forces cancel each other, the decks having coils to conduct cooling (or heating) fluid and the longitudinal members of the supporting frame being tubular to receive the same fluid so that they will change lengths as the decks change length in response to temperature changes.

3,667,136

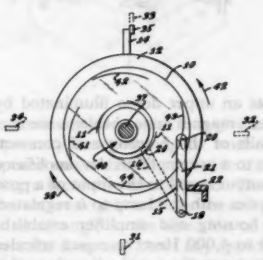
SOUND REPRODUCING EDUCATIONAL TOY BANK

Karen B. Goodkind, Los Angeles; Brett B. Hamilton, Calabasas; Ake L. Larsson, Redondo Beach, and Jimmie L. Whittington, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Continuation-in-part of application Ser. No. 783,952, Dec. 16, 1968. This application Mar. 8, 1971, Ser. No. 122,069

Int. Cl. G09b *19/00*

U.S. Cl. 35—8 A **10 Claims**



A toy bank capable of responding to the insertion of a coin of any one of four denominations, including 1¢, 5¢, 10¢ and 25¢ in any one of four coin slots to reproduce any one

of 16 unique sayings which is a function of the slot in which the coin is inserted and the coin's denomination. A 17th saying is reproducible whenever a coin is not inserted in any of the slots.

3,667,137

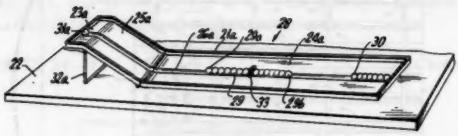
APPARATUS FOR TEACHING ELECTRICAL CONCEPTS

Frank J. Muhlfeld, 300 North Street, Greenwich, Conn.

Filed Apr. 6, 1970, Ser. No. 25,734

Int. Cl. G09b *23/18*

U.S. Cl. 35—19 A **5 Claims**



A method of teaching electrical concepts such as voltage, current and resistance by the use of an analogous mechanical model is disclosed in which potential is simulated by releasing a ball from an elevated position, and electron conduction is simulated by the arrangement of a plurality of abutting balls on a track that are contacted by the released ball.

3,667,138

SPEECH TRAINING APPARATUS AND METHOD OF TEACHING THEREWITH

Ronald S. Cohen, Milwaukee, Wis., assignor to Behavioral Controls, Inc., Milwaukee, Wis.

Filed June 29, 1970, Ser. No. 50,747

Int. Cl. G09b *5/04*

U.S. Cl. 35—35 C **14 Claims**

A housing has an upper dome illuminated by a lamp. A pair of permanent magnet cone speakers are mounted in the opposite sidewalls of the housing and connected in series across the input to a preamplifier. An amplifier connects the sound related output signal to the input of a power transistor connected in series with the lamp to a regulated DC supply. The speakers, housing and amplifier establish a response range from 250 to 4,000 Hertz to reject voiceless sounds. A potentiometer connects the supply directly to the input of the power transistor for preheating of the lamp and controlling the response. A delay switch connects and disconnects a resistor in the base circuit of the transistor to vary the timing and cutoff of the lamp.

3,667,139

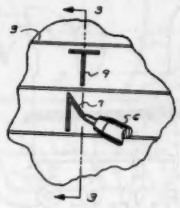
METHOD OF WRITING FOR COMMUNICATING WITH THE VISUALLY HANDICAPPED AND PAPER THEREFOR

Ruth L. Barr, 53 Webster Acres, Webster Groves, Mo.

Filed Sept. 14, 1970, Ser. No. 71,830

Int. Cl. G09b *21/00*

U.S. Cl. 35—38 **16 Claims**



Marking a polyethylene paper overlaying a hard surface with an ordinary extra size ball point pen or dull pencil embosses characters on the upper side of the paper. These raised characters may be read tactually by the visually handicapped, including the blind. The characters can also be read visually. The embossing effect is enhanced by rubbing a finger over the area marked. A paper embossed with equally spaced parallel lines facilitates the method.

3,667,140

PROTECTIVE FOOTGEAR FOR KARATE PARTICIPANTS

Roy E. Hunderford, 120 Christiansen, Houston, Tex.

Filed Sept. 29, 1970, Ser. No. 76,559

Int. Cl. A43b *1/10*; A61f *5/00*

U.S. Cl. 36—4 **6 Claims**

As a representative embodiment of the invention disclosed here, a boot or shoe is provided with protective pads around and under the heel, under the toe, and on the outward side of the shoe. Another pad is placed over the instep and adapted to extend upwardly therefrom to protect the shin of the wearer.

3,667,141

SHOE CLEAT

Samuel H. White, 20137 Sherwood Avenue, Detroit, Mich.

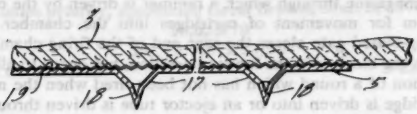
Filed Oct. 16, 1970, Ser. No. 81,278

Int. Cl. A43c *15/00*

U.S. Cl. 36—67 B **9 Claims**

An inexpensive sheet metal cleat for golf shoes or the like is formed by stamping from a strip of metal, such as alu-

minum, and has a body section with a roughened or toothed surface that is attached to the bottom of a shoe and cleats integral with the body section extending in a direction opposite to the roughened surface.

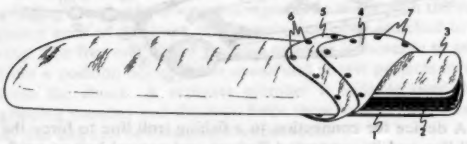


3,667,142

COMPRESSION PAD OF KNITTED ELASTIC

Alfred M. Goodloe, deceased, late of Westfield, N.J., and by Edith Jamison Goodloe, executrix, 105 Duncan Hill Road, Westfield, N.J.

Filed Feb. 27, 1970, Ser. No. 15,030
Int. Cl. D06f *71/36*
U.S. Cl. 38—66 **26 Claims**



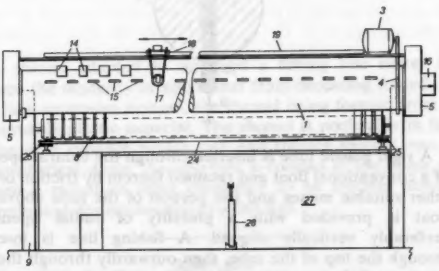
A resilient body for use under compressive conditions comprising knitted material knit from rubber (or other elastic material) thread-like strands, the said body being of sufficient thickness to permit considerable travel of compressing objects into the resilient body. The said resilient body is used as a laundry pad on commercial presses in laundry and cleaning establishments; as a shock mount, vibration damper, vibration isolator, or a cushion or packaging pad, and as a component of automobile or other tires.

3,667,143

FEEDING OF MACHINES

Roger Smith Hall, Thirsk, England, assignor to Baker Perkins Jaxons Limited, Glasgow, Scotland

Filed May 26, 1970, Ser. No. 40,602
Int. Cl. D06f *67/04*
U.S. Cl. 38—143 **7 Claims**



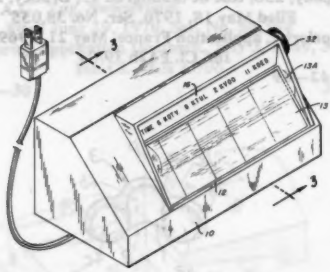
The invention comprises a method of, and apparatus for, feeding sheets to a machine. A sheet has one edge secured temporarily to a cylinder after such edge has been placed under tension and such edge is carried down by the cylinder and released onto an endless conveyor which feeds the sheet to the machine. The sheet edge is preferably secured by suction through openings in the cylinder wall and tensioned by at least one gripping means adapted to have linear movement parallel with the cylinder axis.

3,667,144

SCHEDULE DISPLAY DEVICE

Edward E. Drake, Tulsa, Okla., assignor to LVO Cable, Inc., Tulsa, Okla.

Filed Dec. 15, 1969, Ser. No. 884,915
Int. Cl. G09f *11/29*
U.S. Cl. 40—82 **3 Claims**



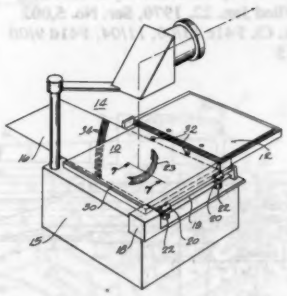
This invention relates to a schedule display device. More particularly, the invention relates to a device for displaying a schedule, such as a television program schedule, printed on a strip of rolled paper, the device including a housing having a window, means within the housing for rotatably supporting the roll of paper, a horizontal drive roller supported in the housing adjacent the window, means of rotating the drive roller, and means of contacting the paper with the drive roller for advancing the paper past the window.

3,667,145

COLOR AND MOTION ANIMATIONS FOR TRANSPARENCIES

John S. Wright, 6115 North Lake Drive Court, Milwaukee, Wis.

Filed Sept. 23, 1969, Ser. No. 860,356
Int. Cl. G09f *13/34*
U.S. Cl. 40—106.53 **13 Claims**



For use on an overhead projector to give an illusion of motion, a transparency sheet bearing art work in the form of a grid is superposed on a relatively movable transparency sheet or web bearing a second or control grid. The lines or groups of lines of the art work grid and the second grid are parallel and both are at an angle to the direction of relative motion. On either sheet the lines may be of any appropriate color and may be made up of rows of dots. Dots of differing color in rows at different angles may be used. On either sheet, but not both, the lines are desirably arcuate and drawn on like radii about centers successively offset on a line parallel to the direction of relative movement, such arcuate lines being tan-

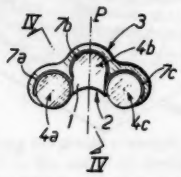
gent to a construction line at the desired 45° angle to the direction of motion. On both sheets, the width or apparent width of respective lines is substantially identical with the width or apparent width of intervening spaces between the lines.

3,667,146

DEVICE FOR RAPIDLY LOADING A REMOVABLE CYLINDER

Jean Dupouy, 258, Rue de Stalingrad 93, Drancy, France

Filed May 18, 1970, Ser. No. 38,055
Claims priority, application France, May 21, 1969, 6916476
Int. Cl. F42b *39/04*
U.S. Cl. 42—89 **5 Claims**



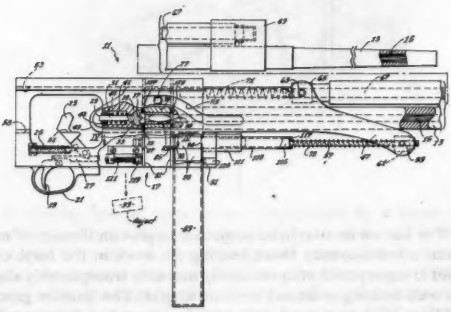
A device for rapidly loading part of a revolver cylinder, the loading speed being the result of a natural combination of a thrusting motion whereby rounds of ammunition carried by said device are inserted into the cartridge chambers of the cylinder, and a sideway motion whereby the device is disengaged. The loading device comprises a substantially flat support having a concave edge and shaped as a circular sector matching a portion of the revolver cylinder, and cartridge case securing elements located on the support in positions registering with the cylinder cartridge chambers, said elements opening out on the same side as the concave edge of the support.

3,667,147

RISING BLOCK RIFLE AND FEED MECHANISM THEREFOR

Morris Goldin, Orange, and Leonard W. Price, Marina Del Rey, both of Calif., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 22, 1970, Ser. No. 5,002
Int. Cl. F41c *13/00, 11/04*; F41d *9/00*
U.S. Cl. 42—15 **11 Claims**



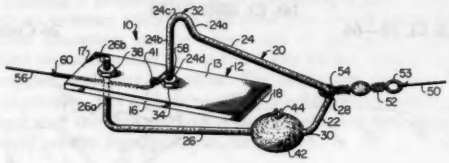
A rifle for use in either full automatic or semiautomatic mode in which a cam system is reciprocated in a direction parallel to the rifle axis either manually or by a gas driven system. The cam system cocks the firing hammer and vertically reciprocates a rifle breech block containing the firing chamber. In the uppermost position, the firing chamber is aligned with a firing pin, which detonates the primer charge in a cartridge, actuated by the hammer when a sear is released by the rifle trigger. When the breech block is in a lowered position the firing chamber is aligned with apertures in a magazine through which a rammer is driven by the cam system for movement of cartridges into the chamber. A spring-biased gate closes the rear end of the firing chamber when the block is in the lowered position, but opens to allow ejection of a round which has not been fired when the next cartridge is driven into or an ejector tube is driven through, the chamber.

3,667,148

FISHING LINE SUBMERGING DEVICE

Donald J. Dawson, Route 4, P.O. Box 124-A, Salem, Oreg.

Filed Sept. 17, 1969, Ser. No. 858,788
Int. Cl. A01k *85/00*
U.S. Cl. 43—43.13 **4 Claims**



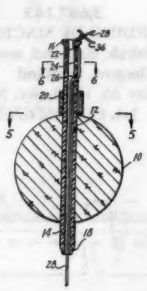
A device for connection to a fishing troll line to force the tail line and its connected flashers and natural bait or artificial lures to a desired depth in water being fished, and including means automatically operated by a fish when striking the bait or lure for setting the fish hook.

3,667,149

ALL-PURPOSE FISHING FLOAT

Jules O. Daigle, P.O. Box 515, Welsh, La.

Filed Oct. 24, 1969, Ser. No. 869,110
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.15 **2 Claims**



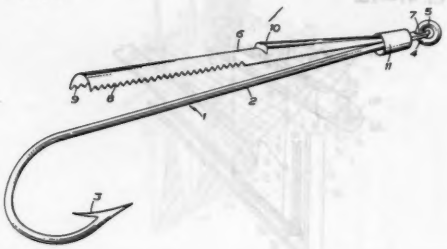
A rigid plastic tube is inserted through the central opening of a conventional float and retained therein by friction or any other suitable means and the portion of the tube above the float is provided with a plurality of radial openings, preferably vertically aligned. A fishing line is inserted through the top of the tube, then outwardly through the uppermost of the openings, thence inwardly through another opening, thence downwardly through the tube and provided therebeneath with a leader, sinker and hook or lure. A sleeve, slidably mounted on the tube above the float, may occupy a neutral position below the radial openings for the relatively free sliding of the fishing line upwardly or downwardly, and, the sleeve may be put in an operative position over the portion of the line lying outwardly of the tube to gently impede the free movement of the line axially to the tube.

3,667,150

HOOKS FOR USE IN FISHING

Ian Keith Hearne, Wayside Langtoft, near Driffield, England

Filed June 9, 1970, Ser. No. 44,812
Claims priority, application Great Britain, Mar. 3, 1970, 10,035/70
Int. Cl. A01k *83/06*
U.S. Cl. 43—44.6 **3 Claims**



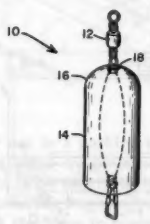
A fishing hook having a shank and a hook end, and a gripping member positioned alongside the shank with the adjacent ends of the hook and gripping member attached to a ring. The free end of the gripping member is movable to and from a position adjacent the shank and at rest projects away from the shank. A separate member is slidable over the gripping member and shank to force them toward each other so that bait can be clamped therebetween.

3,667,151

ANTIFOULING FISHING SINKER

John H. Lamb, 1617 Maryland Avenue South, Minneapolis, Minn.

Filed Mar. 12, 1970, Ser. No. 19,053
Int. Cl. A01k *95/00*
U.S. Cl. 43—44.97 **1 Claim**



A shroud adapted to surround a fishing line sinker to reduce the tendency of said sinker from becoming fouled on the lake or stream bottom, the shroud being formed from a deformable plastic material. The shroud is preferably in the shape of a cylinder having one end thereof formed into a hemispherical dome. An aperture is formed in the dome to permit a swivel or other connector to be forcibly passed therethrough for connection to a fish line.

3,667,152

FUEL COMPOSITION

George W. Eckert, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 827,142, May 23, 1969, now abandoned. This application Sept. 26, 1969, Ser. No. 861,469
Int. Cl. C10l *1/10*
U.S. Cl. 44—58 **10 Claims**

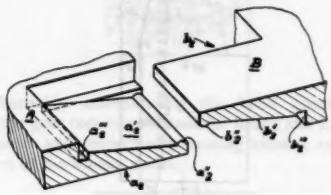
Turbine and diesel fuel composition comprising a hydrocarbon or a mixture of hydrocarbons in the middle distillate, kerosene or gasoline boiling ranges containing Tall Oil Fatty Acid in an amount effective to provide a fuel having a high level of anti-wear, water separation and thermal stability properties and a method for operating a turbine or diesel engine.

3,667,153

INTERLOCKING ARRANGEMENTS

Godtfred Kirk Christiansen, Billund, Denmark, assignor to Interlego A.G., Zug, Switzerland

Filed June 29, 1970, Ser. No. 50,384
Claims priority, application Denmark, July 3, 1969, 3611/69
Int. Cl. A63l *33/06*
U.S. Cl. 46—30 **2 Claims**



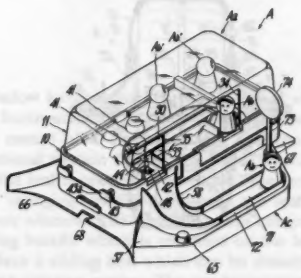
The coupling of two plate-shaped elements be means of an interlocking arrangement formed along the edges of the elements. The locking members of one element are in resilient engagement with identical locking members on the other element, the thickness of the individual locking members being half the thickness of the element and the members being staggered alternately to one side and the other of a plane through the center of the edge parallel to the side faces of the element.

3,667,154

TOY SCHOOL BUS AND STATION DEVICE THEREFOR

Masaru Aoki, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1970, Ser. No. 82,998
Claims priority, application Japan, Oct. 24, 1969, 44/101079
Int. Cl. A63h *33/30, 19/15*
U.S. Cl. 46—40 **7 Claims**



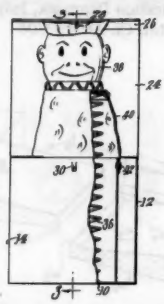
A toy which comprises, in combination, a vehicle, passenger-simulated models to be loaded on and unloaded from the vehicle and a station device having a track part and a platform part. The vehicle has therein conveyor means for the models. When the models are fed onto the conveyor means through an inlet, they are automatically conveyed to an exit and unloaded from the vehicle onto the platform part of the station device.

3,667,155

JACK-IN-THE BOX INCLUDING BOX WITH INTEGRAL INNER CYLINDRICAL WALL

Israel Robert Freelander, 344 Franklin Street, Worcester, Mass.

Filed Nov. 5, 1970, Ser. No. 87,307
Int. Cl. A63h 13/16
U.S. Cl. 46—146 1 Claim



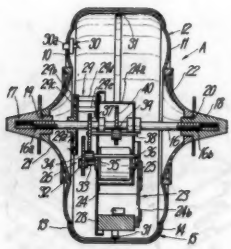
A one-shot molded plastic open-top container comprising a box-like member having an integrally molded central compartment with an open top, and an integrally molded cover for covering both the compartment and the box itself, said cover being hinged at one edge of the box and having a latch to hold it in closed condition of both box and compartment.

3,667,156

MOTOR-DRIVEN ROLLING TOY

Eijiro Tomiyama, Tokyo, Japan, and John H. Heim, Barrington, R.I., assignors to Tomy Kogyo Co., Ltd., Tokyo, Japan, by said Tomiyama

Filed Dec. 2, 1970, Ser. No. 94,314
Int. Cl. A63h 33/26
U.S. Cl. 46—243 M 6 Claims



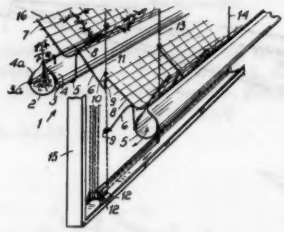
A rolling toy which comprises a substantially wheel-shaped housing and a motivating unit housed therein. The motivating unit is carried by a shaft extending axially along the central axis of the housing and is arranged to be rotated about the central axis. Also, the unit includes power means and other elements which are disposed in eccentric relation to the shaft, whereby when the unit is rotated by the power means, rolling movement is imparted to the housing to cause the same to roll along a surface. The toy can return to its rolling position automatically when overturned.

3,667,157

APPARATUS FOR THE HYDROPONIC CULTIVATION OF VEGETABLES

Fernando Longhini, Genzano, Italy, assignor to Aeroponica S.P.A., Rome Italy

Filed Apr. 23, 1970, Ser. No. 31,293
Claims priority, application Italy, Apr. 26, 1969, 36721 A/69; May 24, 1969, 37384 A/69
Int. Cl. A01g 31/02
U.S. Cl. 47—1.2 5 Claims



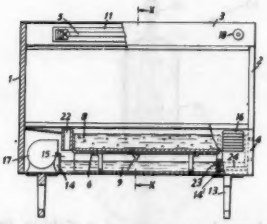
Apparatus for the hydroponic cultivation of vegetables including substantially horizontal tubular structures for holding therein transplanted plants. The tubular structure is made of a trough-like member and lid members of elastically flexible material, yieldably closing the troughlike member and clamping the plant between contacting edges of the lids. The tubular structure is removable suspended on vertically movable vertical ropes guided by a system of pulleys.

3,667,158

CULTIVATION RECEPTACLE

Peter Arthur Privett, 22 Bredon Road, Croydon, England

Filed Oct. 30, 1970, Ser. No. 85,470
Claims priority, application Great Britain, Oct. 31, 1969, 53,518/69
Int. Cl. A01g 9/14
U.S. Cl. 47—17 2 Claims



A combined humidifier and plant apparatus for humidifying the atmosphere and for growing and/or displaying of plants. For the growing of plants, a tray provided in the cabinet supports a layer of soil. The soil is moisturized by a water absorbent material that is partly immersed in a water trough. The humidifying means includes a fan mounted in the cabinet that drives air and water vapor out through an outlet to humidify the atmosphere.

3,667,159

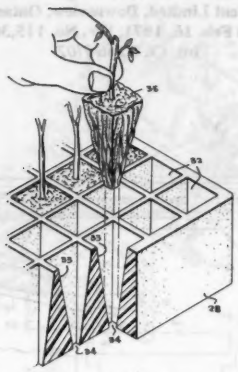
SEEDLING FLAT

George K. Todd, 2019-74th Street Circle, Shaw's Point, Bradenton, Fla.

Filed Sept. 10, 1970, Ser. No. 71,011
Int. Cl. A01g 9/02
U.S. Cl. 47—34.13 6 Claims

A seedling flat is provided in a first embodiment in the form of a unitary plastic member having downwardly extend-

ing square tapered soil receiving recesses in which individual seedlings are started with one embodiment employing a uni-



tary polystyrene foamed plastic; a second embodiment is embodied in a construction formed of rigid plastic plate members connected together in a unitary manner.

3,667,160

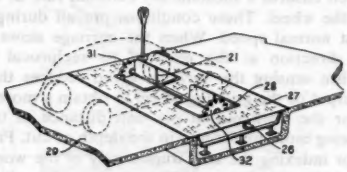
PARKING DEVICE

Charles R. Salloum, 120 Ellis Street, San Francisco, Calif.

Continuation-in-part of application Ser. No. 720,952, Apr. 12, 1968, now Patent No. 3,613,909, and 24,699, Apr. 11, 1970. This application Aug. 27, 1970, Ser. No. 67,429

Int. Cl. E01f *13/00*

U.S. Cl. 49—35 **6 Claims**



A device for use in a parking stall to retain a parked car therein until released by payment of a meter parking fee. Simple rotary or pivot mounted stops are mechanically actuated by an automobile engaging same upon entering a parking stall to lock the steps in position to block further wheel passage until released as by a coin operated timer.

3,667,161

SHUTTER OPERATING MECHANISM

John H. Sassano, Hollywood, Fla., assignor to Weather Control Shutters, Inc., Hollywood, Fla.

Filed Oct. 16, 1970, Ser. No. 81,467

Int. Cl. E06b *9/02*

U.S. Cl. 49—56 **7 Claims**

Operating mechanism adapted to be incorporated in a window closure installation including a shutter panel hingedly supported on a horizontal hinge axis and swingable toward and away from the plane of closure of a window opening. The shutter operating mechanism includes a speed reduction assembly including a worm and worm gear fixedly secured respectively on first and second shaft means perpendicularly arranged. A pair of arms is fixed in coplanar arrangement on the first shaft means and include distal end portions runningly engageable in track channel members coplanar supported on opposite edge margins of the shutter panel. The second shaft means extends through the building wall and is fitted with a hand crank member arranged in the building interior. Turnably manipulating the hand crank operates through the gear reduction means for lifting and lowering the pair of arms and respectively causing closing and opening movement of the shutter panel.

3,667,162

ROCKING-SWINGING WINDOW LEAF

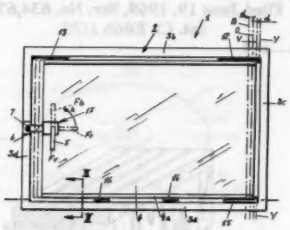
Christian Lalague, Paris, France, assignor to Boussois Souchon Neuvesel, Paris, France

Filed Oct. 30, 1970, Ser. No. 85,509

Claims priority, application France, Nov. 19, 1971, 6939722

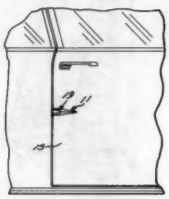
Int. Cl. E05d *15/52*

U.S. Cl. 49—192 **11 Claims**



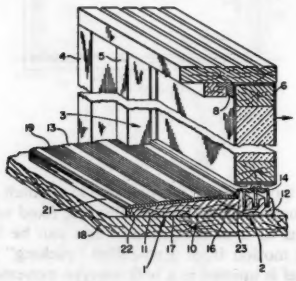
A window having a rocking-swinging leaf which can be displaced horizontally in its plane within the fixed window-casing by means of a control system and can be brought by translational motion from a so-called "rocking" position in which the leaf is opened in a bellows-type movement to a so-called "swinging" position in which the leaf is opened as a casement window. The control system comprises a rotatable operating handle which is mounted on the leaf and adapted to displace a sliding bolt which can be detachably secured to the fixed window-casing. The control system and ancillary devices for attaching the leaf to the casing are so arranged as to permit translational motion of the leaf in the plane of the casing between any one of three positions, namely the closed position, the "rocking" position and the "swinging" position. The centralized control of the leaf from a handle which is carried by this latter permits considerable simplification of the guiding means while the motion-transmission means are constituted in addition to the sliding bolt and ancillaries by the leaf itself.

3,667,163
AUTOMOBILE DOOR GUARD
Erick H. Bjorum, 640 Island View Drive, Seal Beach, Calif.; John G. Gibson, 18985 Santa Mardina, Fountain Valley, Calif., and Morgan C. Lindberg, North Hollywood, Calif.
Filed Oct. 8, 1970, Ser. No. 79,201
Int. Cl. B60j 5/04
U.S. Cl. 49—462 5 Claims



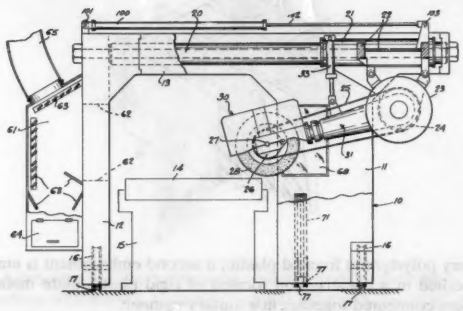
An automobile door guard including a mounting plate formed on one side with mounting surface for securement to the exterior of an automobile door. A protruding resilient bumper is mounted on the side of the mounting plate opposite the one side. Adhesive means is disposed on the mounting surface and is covered with a removable covering strip whereby such strip may be removed and the guard positioned on an automobile door with the adhesive means exposed for adhering such guard to the door.

3,667,164
DOOR SILL
Cray J. Coppins, 13700 Fairhill Road, Cleveland, Ohio
Filed June 19, 1969, Ser. No. 834,674
Int. Cl. E06b 1/70
U.S. Cl. 49—469 7 Claims



Door sill includes a substrate or base member of wood or other insulating material having a metal sill cover secured to the exterior projecting portion of the substrate and terminating adjacent the exterior side of the door when in the closed position, and having a rigid vinyl thermal barrier member connected to the substrate directly beneath the door when in the closed position as by means of downwardly projecting ribs which extend into grooves in the substrate. A sealing strip on the bottom of the door provides sealing contact with the rigid vinyl member when the door is in the closed position.

3,667,165
CONDITIONING GRINDER
Philip R. McDowell, and Charles W. Vekovious, both of Downsview, Ontario, Canada, assignors to G & B Automated Equipment Limited, Downsview, Ontario, Canada
Filed Feb. 16, 1971, Ser. No. 115,364
Int. Cl. B24b 7/02
U.S. Cl. 51—35 8 Claims

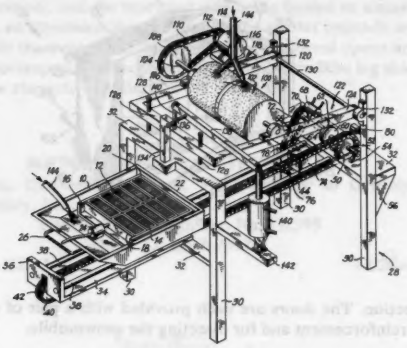


A travelling carriage carrying a motor driven grinding wheel at the end of a pivoted arm reciprocates back and forth along a steel slab workpiece. A hydraulic cylinder forces the wheel down against the workpiece, this downward movement being controlled in accordance with the power being supplied to the motor and the speed of reciprocating travel of the carriage. Control of the contact pressure of the wheel is thus based on the power being absorbed by the motor, which ensures a substantially constant rate of work output by the wheel. These conditions prevail during carriage travel at normal speed. When the carriage slows down to change direction at the ends of its reciprocal travel, a mechanism sensing the carriage speed reduces the rate of work output of the grinding wheel to obtain a more constant value for the work output per unit distance of travel, the result being more uniformity in the depth of cut. Provision is made for indexing the arm transversely of the workpiece at each end of carriage travel. The maximum magnitude of the acceleration and deceleration of the carriage at the travel ends is limited in order to increase the comfort of an operator seated on the carriage. The grinding wheel peripheral speed is kept constant by a radioactive source and detector system that measures wheel diameter and speeds up the motor as the wheel wears. To facilitate this speed control a D.C. motor is used. As an alternative to a moving carriage, the structure carrying the grinding wheel can be stationary, the workpiece holder then reciprocating, the same controls over the grinding wheel pressure being exercised.

3,667,166
APPARATUS FOR GRINDING GLASS SLIDES OR THE LIKE
James C. White, Rutherford, N.J., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed Dec. 29, 1969, Ser. No. 888,770
Int. Cl. B24b 7/00
U.S. Cl. 51—92 4 Claims

A grinding apparatus designed to grind articles such as glass slides. A work carriage is situated over a pair of guide bars and supported for free movement therealong by way of a bearing means operatively connected with the work carriage and having rolling contact with the guide bars. A rotary

grinding unit is supported in a floating manner with respect to a frame of the apparatus so that the rotary grinding unit



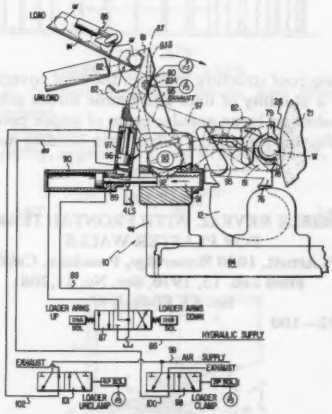
can, if necessary, yield when encountering extreme grinding stresses.

3,667,167

WORK DRIVING DEVICE FOR AUTOMATIC CAMSHAFT GRINDING MACHINE

William Emory Happel, Waynesboro, Pa., assignor to Landis Tool Company

Filed Jan. 26, 1971, Ser. No. 109,770
Int. Cl. B24b *47/02*
U.S. Cl. 51—215 H **5 Claims**



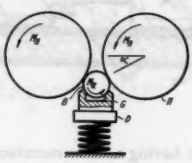
A work driving apparatus for a machine tool, such as a cam contour grinding machine, for applying a driving torque against two spaced angular points through end portion (**57**) and a carbide block (**64**), to rotate the workpiece with minimal radial displacement. A driving block (**41**) is hinged to a face plate (**28**) to enable the driving block (**41**) to compensate for size variations of the workpiece and to insure concentricity with the periphery of the workpiece (W), such as an automotive camshaft. Rotation of the work driving device (**26**) automatically angularly orients the workpiece relative, for example, to a master cam (**19**), as work rest pressure restrains rotation of the workpiece. This allows an automatic work loader to be used without any devices to regulate the angular position of the workpiece.

3,667,168

MANUFACTURE OF BEARING BALLS

Jaroslav Brany, Praha, Czechoslovakia, assignor to Vyzkumny ustav strojirenske technologie a ekonomiky, Praha, Czechoslovakia

Filed Feb. 26, 1970, Ser. No. 14,520
Claims priority, application Czechoslovakia, Feb. 28, 1969, 1503/69
Int. Cl. B24b *1/00*
U.S. Cl. 51—289 **9 Claims**



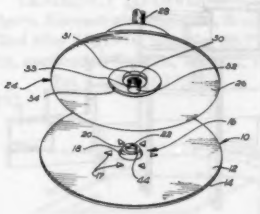
The method and apparatus for machining bearing balls comprising the steps of locating the balls between two opposed working surfaces rotating one of the bodies about an axis, and driving the other body in plane angular thereto and tangentially of the ball to create a rolling of the ball resulting from two independent component axes of force created by the interaction of the two bodies.

3,667,169

ABRASIVE FINISHING ARTICLE

Joseph H. MacKay, Jr., Woodland Hills, Calif., assignor to Norton Company

Filed Apr. 27, 1970, Ser. No. 32,295
Int. Cl. B24d *13/14, 13/20*
U.S. Cl. 51—379 **10 Claims**



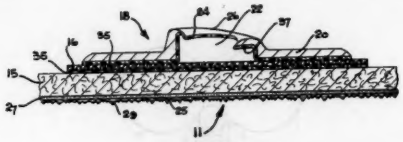
An abrasive finishing article in which an axially projecting drive member secures the article to a support pad. The drive member is formed with a hollow threaded boss, disposed through a centrally defined opening in the article, and an outwardly extending member at the base of the boss disposed on the opposite side of the article to press the article against the support pad. The outwardly extending member can be formed with a plurality of tabs which are pressed into engagement with backing material of the article whereby to secure the drive member in intimate integral connection with the article. The support pad includes a core-socket member and an axial stud whereby the drive member boss may be threadably retained in female-male engagement with the stud and core member, respectively, the core member being formed with internal and external abutment surfaces for close fitting engagement with the top surface of the drive member and surfaces of the finishing article laterally thereof, respectively.

3,667,170

FINISHING ARTICLE AND SUPPORT MEMBER THEREFOR

Joseph H. MacKay, Jr., Woodland Hills, Calif., assignor to Norton Company

Filed Mar. 11, 1969, Ser. No. 806,250
Int. Cl. B24d *17/00*
U.S. Cl. 51—389 **9 Claims**



A finishing article having a drive member permanently affixed on one side thereof. The drive member comprises a hollow boss open at its outer end and has an annular lip defining an internal screw thread. A support member is provided connectable with the drive member and can include an axial stud having an external screw thread, formed for insertion within the driving member boss, and a central socket disposed radially about the stud and close fit therewith for abutment against the driving member boss.

3,667,171

ROW FOLDING SEATING STRUCTURE

Robert G. McClelland, and David W. Raymond, both of Champaign, Ill., assignors to American Seating Company, Grand Rapids, Mich.

Filed Jan. 8, 1971, Ser. No. 104,917
Int. Cl. A47c *1/12*; E04h *3/12*
U.S. Cl. 52—9 **15 Claims**

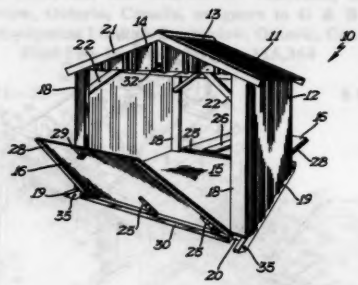
In a row seating structure a series of telescoping rows are provided, each row having spaced vertical carriage-mounted columns, each having a cantilever arm adapted to rest upon the next adjacent column when the telescoping structure is extended and a transverse rear riser beam connecting the columns in the row and equipped with forwardly extending supporting arms anchored at their rear upon the riser, and a spectator tread or platform supported by the arms, the arms also providing a seat above the forward end of the tread panel or platform.

3,667,172

VEHICLE HUT

Aliver M. Erickson, P. O. Box 363, Elk River, Minn.

Filed June 24, 1970, Ser. No. 49,223
Int. Cl. E04h *1/12*
U.S. Cl. 52—64 **9 Claims**



A hut for housing a snowmobile or similarly sized vehicle having a pair of bottomly hinged doors for permitting the snowmobile to enter and exit while traveling in a forward direction. The doors are each provided with a pair of guides for reinforcement and for directing the snowmobile.

3,667,173

HANGING ROOF STRUCTURE

Karl Lennart Billgren, grev Magnigatan 4, Stockholm, Sweden

Filed May 19, 1970, Ser. No. 38,829
Int. Cl. E04b *1/342*, *1/347*
U.S. Cl. 52—83 **7 Claims**

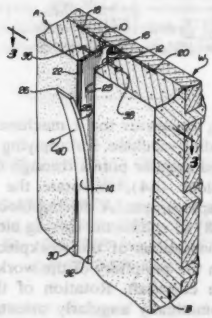
A hanging roof structure in which the roof covering is supported by a plurality of lines and tensile forces acting in the lines are taken up by an annular beam of lattice construction, thereby relieving supporting pillars from bending moments.

3,667,174

EXPANSIBLE REVEAL WITH FRONTAL TEAR STRIP FOR PLASTER WALLS

Robert W. Arnett, 1030 Stoneridge, Pasadena, Calif.

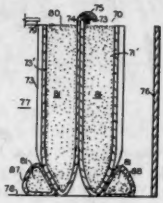
Filed Feb. 13, 1970, Ser. No. 11,206
Int. Cl. E04b *1/41*
U.S. Cl. 52—100 **1 Claim**



An extruded generally T-shaped separator or screed is tacked along the wall base with the center leg projecting out-

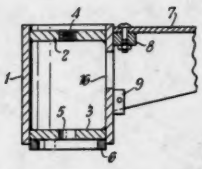
wardly. Plaster is applied to the wall base to interlock opposite sides of the screed leg. The screed leg is itself hollow, the frontal exposed side being a tear strip finally removed to form a reveal, and the rearward side being bowed or sinuous to form an expansion mechanism. As the plaster expands and contracts transversely to the screed leg, the reveal opens and closes correspondingly without any separation of the leg sides from the respective sections of the cast wall.

3,667,175
SOUND ABSORPTION STRUCTURES
Johan A. Bjorksten, Madison, Wis., assignor to Griffolyn Company, Inc., Houston, Tex.
Filed Feb. 16, 1970, Ser. No. 11,395
Int. Cl. E04b 1/82
U.S. Cl. 52—144 **7 Claims**



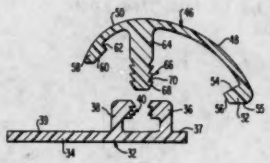
Sound absorption assemblies each comprising a plurality of units, each comprising a laterally extending series of vertically extending readily loaded flexible pockets, each holding a weighty particulate mass while permitting some relative motion therein, pockets of one unit complementing the pockets of the adjacent unit.

3,667,176
SPIRAL STAIRCASES
Donald R. H. MacKay, Britannia Works, East Road, Cambridge, England
Filed Feb. 18, 1970, Ser. No. 12,377
Claims priority, application Great Britain, Feb. 18, 1969, 8,696/69
Int. Cl. E04f 11/00
U.S. Cl. 52—187 **15 Claims**



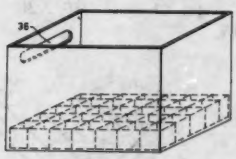
A spiral staircase is built up from modular fabricated step units superimposed upon one another without necessitating the use of an independent continuous central newel column. Each step unit essentially comprises a tubular newel boss having a vertical axis, attached to a tread which extends laterally and radially in a horizontal plane. The step units are secured to each other so that their bosses together constitute the central newel post of the staircase. The staircase can be erected from a base level, after the lowermost step unit has been firmly secured, and while it is being erected, the builders can use those units which have already been assembled for the purpose of carrying up further step units.

3,667,177
MOLDING JOINTS AND UNIVERSAL MOLDING MEMBERS THEREFOR
Elmer G. Biela, 2332 Rolling Hill, S.E., Grand Rapids, Mich.
Filed May 8, 1970, Ser. No. 35,676
Int. Cl. E04d 1/36; E04c 1/39
U.S. Cl. 52—278 **11 Claims**



A molding joint for thin wall paneling and molding members therefor. A retainer is positioned with a base flange behind a paneling member as it is being installed. The retainer has a receiving area formed from upstanding arms to receive and engage the tongue of a T-shaped molding cap which is applied after the work is completed. The two-piece molding combination can be used for all types of panel joints including inside and outside corners, butt joints, joints between walls and ceilings and walls and floors, and joints between the edge of paneling members and the wall surfaces to which they are attached. Tile-tub joints and tile-wall surface joints are also formed with the invention.

3,667,178
METHOD AND MEANS FOR BINDING OF GROUND SURFACES ON BEDDING WHICH IS UNEVEN OR HAS A TENDENCY TO GIVE WAY
Knut Borge Algers, Ehrenstrahlsvagen 40, Bromma, Sweden
Filed May 22, 1970, Ser. No. 39,770
Claims priority, application Sweden, May 28, 1969, 7494/69
Int. Cl. E02d 27/00
U.S. Cl. 52—292 **6 Claims**



The present invention relates to a method and means for binding ground surfaces on bedding that is uneven or has a tendency to give way. A building and/or bedding are provided with a system of mutually connected vertical walls forming a grid, said walls forming or being provided with openings into which loose material is introduced to support the walls laterally and vertically after height adjustment or levelling of said wall system. The height adjustment or levelling is accomplished by means of jacks provided in or under the grid-work, and can be effected in one or more stages. The arrangement can be used to reinforce bedding irrespective of whether or not there is a building standing on it; modifications can be made to suit the purpose of the arrangement.

3,667,179

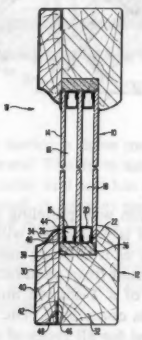
WOODEN WINDOW UNITS HAVING PROTECTIVE COVERINGS

Morris M. Eisenberg, Ste. Genevieve, Mo., assignor to Biltbest Corporation, Ste. Genevieve, Mo.

Continuation-in-part of application Ser. No. 856,630, Sept. 10, 1969, now Patent No. 3,553,913, dated Jan. 12, 1971, which is a continuation-in-part of application Ser. No. 687,748, Dec. 4, 1967, now abandoned. This application May 1, 1970, Ser. No. 33,809

Int. Cl. E04c *2/34*; E06b *3/66*

U.S. Cl. 52—302 6 Claims



A two-part laminated wooden sash having a groove along its inner face for receiving peripheral portions of a window pane and sealant material in the groove is provided. The external wooden sash part is provided with a dual plastic extrusion having a first portion forming a generally U-shaped sheath of semi-rigid material for receiving the first part prior to final assembly of the wooden unit. The second portion of the extrusion includes a flexible lip along the edge of the sheath for sealing against the window pane. In another form hereof, dual and triple panes of glass are employed to provide insulating panels with spacers between the panes, or a single pane of glass.

3,667,180

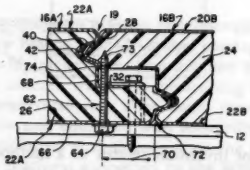
FASTENING MEANS FOR DOUBLE-SKIN FOAM CORE BUILDING CONSTRUCTION PANEL

Walter Tischuk, Richmond, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Nov. 3, 1970, Ser. No. 86,427

Int. Cl. E04c *1/10, 2/20*

U.S. Cl. 52—309 7 Claims



A double-skin building construction panel having a foam core and having its outer skin laterally offset from and spaced-apart from its inner skin — each panel presenting an overlapping edge portion along one side and an overlapped edge portion along its opposite side. The panels are adapted to be assembled in lapped relation without externally visible fasteners. Mating elements in the outer skin provide positive mechanical engagement of adjacent outer facing sheets when the panels are erected to the structural framework of a building. A clip and fastener arrangement is provided for securing the overlapped edge portion of each panel to the subgirts of a structural framework.

3,667,181

FURNACE WALL PARTICULARLY FOR OPEN-HEARTH FURNACES

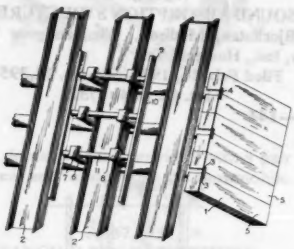
Gunter Simon, Wiesbaden, Germany, assignor to Didier-Werke A.G., Wiesbaden, Germany

Filed Aug. 3, 1970, Ser. No. 60,688

Claims priority, application Germany, Sept. 16, 1969, P 19 46 800.9

Int. Cl. E04b *2/56*

U.S. Cl. 52—496 3 Claims



A furnace wall particularly for the rear wall and the like of an industrial furnace having a furnace framing with wall posts. Horizontal carrier rails elevationally slidably mounted on the wall posts locate the wall-forming refractory bricks of each two consecutive courses of bricks. The bricks have complementary cooperating recesses to embrace the carrier rails. Fastening members are provided for the carrier rails and locking elements bearing against the wall posts releasably engage the fastening members. The fastening members are angle brackets projecting externally beyond the thickness of the wall posts with upwardly pointing free angle ends. The locking elements may be ladder-like locking elements having at least one stringer and a plurality of transverse rungs mounted on the sides of the wall posts facing away from the furnace interior so that the rungs interpose themselves between the wall posts and the free angle ends in a vertical row.

3,667,182

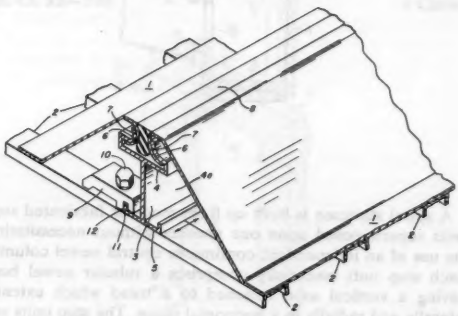
BUILDING STRUCTURES

Jay R. Stemler, Export, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 20, 1970, Ser. No. 30,106

Int. Cl. E04b *1/40*

U.S. Cl. 52—497 2 Claims



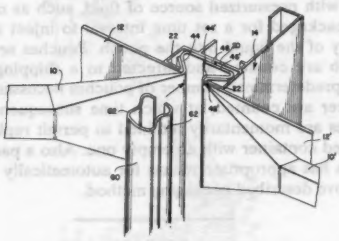
Sheet panels are connected to building structural framing by attaching them to a spline which has a sliding fit with a clamp fastened to the framing, thus permitting movement of the panels relative to the framing.

3,667,183

WALL PANELING SYSTEM

William C. Heirich, 2912 Wauhilah Drive, Muskogee, Okla.

Filed Nov. 19, 1969, Ser. No. 878,098
Int. Cl. E04c 2/32; E04b 1/40
U.S. Cl. 52—497 1 Claim



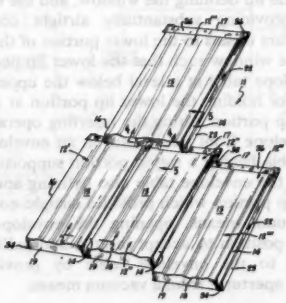
Aluminum wall paneling system featuring panels capable of being arranged in a variety of patterns and including deep contoured face panels which when used by themselves form a solar wall, back panels which when used with the face panels form a baffled flange arrangement permitting entrance of air and diffused light between the panels while presenting a solid front appearance, furring channels accepting the face and back panels and also roll form paneling of different design and lock channels for snapping within the furring channels securing various combinations of the aforementioned panels in place while permitting their removal, when desired.

3,667,184

INTERLOCKING METAL SHINGLE CONSTRUCTION

Clifford C. Merrill, Ferndale, and Carl E. Strombeck, Loleta, both of Calif.

Continuation-in-part of application Ser. No. 804,424, Mar. 5, 1969, now abandoned. This application Feb. 24, 1970, Ser. No. 13,592
Int. Cl. E04d 1/00
U.S. Cl. 52—530 9 Claims



A metal shingle construction containing simulated shingles formed of sheet metal which present the appearance of wooden Hollywood shakes. The shingles of adjacent courses are in interlocking engagement as are adjacent shingles in each course so as to prevent a hard and driven rain from penetrating the joints between adjacent shingles, as well as to prevent flapping of the shingles in the wind. Nailing of the shingles to a roof substructure is only required at one end of each shingle, securance of the opposite end being provided by interlocking engagement with the shingles of an adjacent course. The nails, or other fastening means, are disposed in the shingle construction in completely sheltered position with respect to the weather without requirement of mastic or equivalent sealing means. The shingles are arranged such that prior to attachment of the shingles of each course the shingles therein may be shifted laterally and angled, or "skewed", relative to each other to adjust the length of the course to the dimensions of the roof and thereby prevent the course from overlapping the edge of the roof.

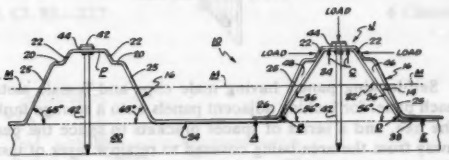
Special forms of shingles are provided for forming valleys, and another special form is provided for constructing hip roofs — both of which are necessary when two flat roof surfaces intersect to form a valley or a hip. Generally speaking, the construction of these special shingles is substantially the same as that outlined above for regular shingles, but differs in the one respect that one side of the shingle is formed at an angle to the other side. The shingles designed for use in valleys are narrow at the lower and thicker end and wider at the top and thin end, while the shingles designed for hips are wider at the lower end and narrow at the upper. These special shingles for both hips and valleys are necessarily constructed, sold and used in pairs as they must form a special joint where they abut at the hip or valley. Another difference between these special shingles for valleys and those for the regular flat roof structure lies in the fact that there is no flange or gutter where the two valley shingles of each pair abut each other.

3,667,185

PANEL AND LAP JOINT MADE THEREFROM

Joseph M. Maurer, Concord, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 30, 1970, Ser. No. 23,743
Int. Cl. E04d 3/30
U.S. Cl. 52—537 10 Claims



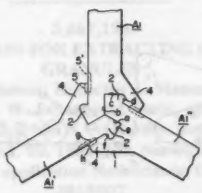
An improved weatherproof joint formed from overlapping one panel of improved design with another panel wherein the opposing marginal side edges of the panels are provided in the joint area with improved interfitting and opposing corrugations which form a unique deep truss-like lap joint structure having improved load-bearing characteristics.

3,667,186

CONCRETE BLOCKS

Shoji Kato, 1 Kitahata, Kobata, Uji, Japan

Filed Aug. 17, 1970, Ser. No. 64,263
Claims priority, application Japan, Aug. 16, 1969, 44/64910
Int. Cl. E04b 2/18, 2/26
U.S. Cl. 52—594 10 Claims



An outwardly bent engaging projection and an engaging depression are formed at each end of a substantially flat-

shaped concrete block. The engaging depression receives an engaging projection of another concrete block, while the engaging projection of the first concrete block is received by an engaging depression of still another concrete block. Thus engaged with one another so as to be horizontally inseparable, a plurality of such concrete blocks form a honeycomblike framework which, supplemented with appropriately shaped other concrete blocks of the invention, is rendered into a desired substructure.

3,667,187

SELF-LOCKING PREFABRICATED PANELS

John Jerit, Oak Lawn, Ill., assignor to Brand Insulations, Inc., Chicago, Ill.

Continuation of application Ser. No. 766,450, Oct. 10, 1968. This application May 1, 1970, Ser. No. 33,767

Int. Cl. E04b *1/74, 2/08;* E04c *2/32*

U.S. Cl. 52—582 **7 Claims**

Self-locking panels having male clips and female slots in each panel for locking adjacent panels onto a storage tank or the like, and a series of spacer brackets to space the panels away from the area being covered to retain a layer of insulation, and interlocks between the panels lying in a vertical plane in end to end relationship.

ERRATUM

For Class 52—213 see:
Patent No. 3,667,192

3,667,188

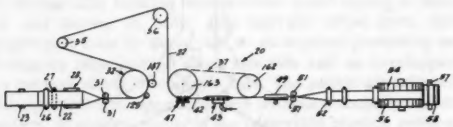
METHOD AND APPARATUS FOR FORMING AND FILLING INDIVIDUAL POUCHES

Harold Thomas Benner, Jr., and Charles E. Cloud, both of Wilmette, Ill., assignors to Cloud Machine Corporation, Skokie, Ill.

Filed Feb. 25, 1970, Ser. No. 13,873

Int. Cl. B65b *43/04, 57/10*

U.S. Cl. 53—29 **39 Claims**



A method of packaging including the steps of forming and sealing a continuous web of film material into a plurality of longitudinally spaced pouches separated by transversely sealed areas having opposed sidewalls opened along an upper edge portion and closed along a bottom edge is characterized as further comprising the steps of moving adjacent ones of the seals together while injecting air into the pouch and lifting the closed bottom edge to optimally open the pouches prior to filling the same. The open pouches are filled by introducing a nozzle into the pouch and communicating the nozzle with pressurized source of fluid, such as condiments, to be packaged for a set time interval to inject a measured quantity of the liquid into the pouch. Pouches severed from the web are counted and directed to a shipping container until a predetermined number of pouches necessary to fill the container are counted, at which time subsequently severed pouches are momentarily retained to permit replacement of the filled container with an empty one. Also a packaging apparatus has appropriate means for automatically performing the above described packaging method.

3,667,189

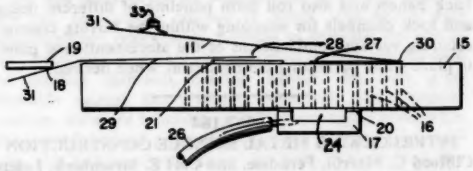
ENVELOPE WINDOW HOLDER FOR AN INSERTER AND METHOD

Frank M. Blossom, Glen Ellyn, Ill., assignor to The Reuben H. Donnelley Corporation, New York, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,006

Int. Cl. B65b *43/30*

U.S. Cl. 53—29 **3 Claims**



An envelope open window holder to facilitate the insertion of mailing pieces to be contained in an envelope having an open window for purposes of displaying the address, having an envelope table to support an envelope front side down and held in an open position by opener means to accept inserts, the table having a raised portion supporting the upper portion of the lip defining the window, and the table defining apertures providing substantially airtight communication from a vacuum means to the lower portion of the lip defining the envelope window such that the lower lip portion adheres to the envelope table at a level below the upper lip portion. A method for holding the lower lip portion at a level below the upper lip portion during the inserting operation by placing the envelope front side down on an envelope table, the envelope table having a raised portion supporting the upper lip portion, the envelope table also defining apertures under the lower lip portion which provides airtight communication with a vacuum means, opening the envelope by opener means to a position to accept inserts, and pulling the lower lip portion to the envelope table by providing suction through the apertures from a vacuum means.

3,667,190

ORCHARD MACHINE

Walter E. Thornton-Trump, 1544 Knareswood Drive, Port Credit, Ontario, Canada

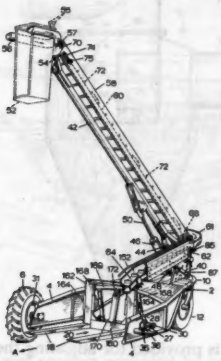
Filed June 11, 1970, Ser. No. 45,295

Int. Cl. B65b *57/00;* B65g *47/44*

U.S. Cl. 53—59 **10 Claims**

A three wheeled orchard machine having a boom which raises and lowers a picker's platform. The platform is levelled by a conveyor housing which acts both as a levelling rod and to convey picked fruit to a lower conveyor. The lower conveyor delivers the fruit to a bin filler mechanism, which is also levelled by a levelling rod. The bin filler mechanism has

a fixed bottom, and a rotating sidewall having apertures therein. As the sidewall rotates, the fruit is distributed evenly in a bin located below the bin filler mechanism. A



microswitch in the bottom of the rotating sidewall causes the bin filler mechanism to lift as the level of fruit in the bin increases. The bin filler mechanism and the upper and lower conveyors are all driven from one hydraulic motor.

3,667,191

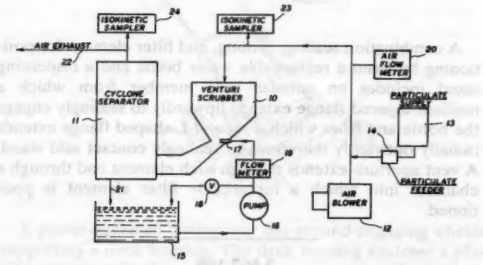
REMOVAL OF PARTICULATE MATTER FROM GASEOUS WASTES BY WET COLLECTORS

Martin Prince, Wayne, N.J.; Hillard Blanck, Floral Park, N.Y., and Gregorio Tarancon, Elizabeth, N.J., assignors to Saleen Development Corp., New York, N.Y.

Filed Nov. 24, 1970, Ser. No. 92,410

Int. Cl. B01d *47/10*

U.S. Cl. 55—87 **23 Claims**



In the removal of particulate matter from gaseous wastes by wet collectors, such as venturi scrubbers, the liquid employed to achieve such removal is water with an additive dissolved therein to substantially improve the collection of the particulate matter thereby. The additive dissolved in the water has, as its essential constituent, a preferably reactive mixture of an alkyl or dialkyl-phenyl polyethoxy alcohol, an N-substituted acid amide and an ethoxylated fatty alcohol. The alkyl or dialkyl-phenyl polyethoxy alcohol and the N-substituted acid amide are preferably present in the additive mixture in approximately equal molar amounts and preferably each comprise at least 35 wt. % of the mixture, and the ethoxylated fatty alcohol may comprise from ½ to 40 wt. % of the mixture and preferably from 1 to 30 wt. % thereof.

3,667,192

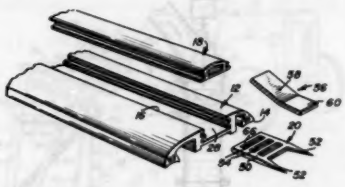
DOOR THRESHOLD AND FASTENER ASSEMBLY

Curtis O. Sewell, Highway 43, Saraland, Ala.

Filed Feb. 25, 1970, Ser. No. 14,005

Int. Cl. E06b *3/00*

U.S. Cl. 52—213 **6 Claims**



A base member is positioned against a floor and between bordering door jambs. The base member includes a groove therein for slidably retaining fasteners which are driven along the groove and into engagement with the jambs thereby clamping the threshold assembly against the floor of the door. The fasteners include slots therein which permit insertion of a tool so that upon application of withdrawing forces on the fasteners, they are easily disengaged from the jambs thus permitting removal of the threshold assembly.

3,667,193

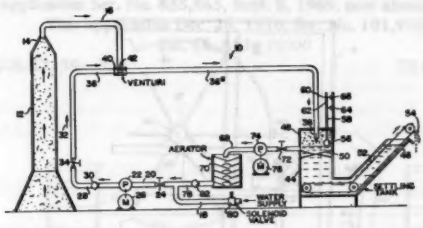
SMOKE POLLUTION ELIMINATOR

William A. McKenzie, Route 5, 6950 Chatham Road, Medina, Ohio

Filed Apr. 24, 1969, Ser. No. 818,952

Int. Cl. B01d *47/10*

U.S. Cl. 55—227 **6 Claims**



The pollution eliminator is adapted for connection to the outlet of a chimney and includes a pump having a water supply connected thereto and an outlet pipe receiving a substantially full line pressure flow of water from the pump. Smoke means connect to the outlet pipe for introduction of smoke into the water filled line, a settling tank is connected to the outlet pipe to receive a smoke-water mixture therefrom, and an aerator receives water from the upper portion of the settling tank for ultimate return of water to the pump for closed system water circulation purposes.

3,667,194

INSTALLATION FOR EXTRACTING GAS FROM GRANULES

Hendrik Waning, Heleen; Hubertus A. Mannens, Hoensbroek, and Arnoldus A. W. Schaapveld, Stein, all of Netherlands, assignors to Stamicarbon N.V., Hurlen, Netherlands

Filed Oct. 20, 1969, Ser. No. 867,769

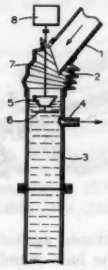
Claims priority, application Netherlands, Oct. 19, 1968, 6815007

Int. Cl. B01d *45/02*

U.S. Cl. 55—247 **5 Claims**

In order to dislodge our bubbles from particles e.g. cut cylindrical fibers, as they enter a confined liquid body

through a surface, a small portion of the liquid body near the surface is vibrated and the particles are funneled into the liquid body through the surface by means calculated to subject each particle to about the same amount of vibration. By preference this includes funneling the particles onto the central region of a submerged, perforated plate. The particles vibrate to the periphery of the plate and fall into the gap between the plate and the confining walls of the liquid body. In a counter current liquid extraction system, liquid may pass up through the plate perforations.



3,667,195

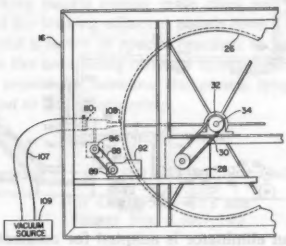
ROTARY AIR FILTER CLEANING APPARATUS

Fredrick Ernest Angilly, Jr., Cranston; George Lindol Miner, Warwick, and Lionel Anthony James Sousa, Coventry, all of R.I., assignors to Grinnell Corporation, Providence, R.I.

Filed Mar. 16, 1970, Ser. No. 19,731

Int. Cl. B01d *41/04*

U.S. Cl. 55—272 **5 Claims**



This specification discloses vacuum cleaning apparatus for a rotary drum filter in which a drive screw for moving the suction nozzle axially of the rotary drum is supported by two movable bearings in addition to end bearings. The movable bearings are positioned on guide members which extend parallel to the drive screw to support the drive screw against sagging at locations between the suction nozzle and the end bearings. The movable bearing are spaced by rigid connecting rods. As one movable bearing is pushed along the guide member by the advancing suction nozzle, the rods pull the other movable bearing along to support the drive screw.

3,667,196

ADJUSTABLE CYCLONE SEPARATOR

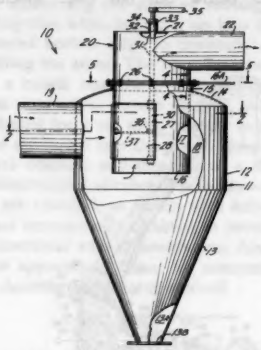
William J. Koenecke, Glen Rock, N.J., assignor to Metal Improvement Company, Inc.

Filed Sept. 1, 1970, Ser. No. 68,697

Int. Cl. B04c *5/04*

U.S. Cl. 55—312 **7 Claims**

In a cyclone separator, a valve means adjustable to cause partial by-pass of gaseous fluid and solid particles entrained therein from the separation chamber to the gaseous fluid outlet. Also, means is provided for adjusting the location of the valve means relative to the separation chamber.



3,667,197

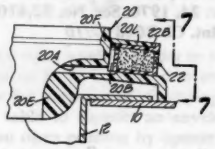
COMBINATION SEALING, VENTING, AND FILTERING MEANS

Carl E. Frahm, 1428 Oak Meadon Road, and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif.

Filed Mar. 23, 1970, Ser. No. 21,763

Int. Cl. B01d *46/10*

U.S. Cl. 55—502 **2 Claims**



A combination sealing, venting, and filter element for positioning between a replaceable water bottle and a dispensing stand includes an annular base member from which a resilient tapered flange extends upwardly to sealingly engage the bottle and from which a second L-shaped flange extends radially outwardly therefrom to sealingly contact said stand. A vent aperture extends through such element and through a chamber into which a replaceable filter element is positioned.

3,667,198

MOUNTING ADAPTOR FOR A REEL STRUCTURE

Charles M. Gibson, Stockton, Calif., assignor to Universal Harvester Co., Inc., Stockton, Calif.

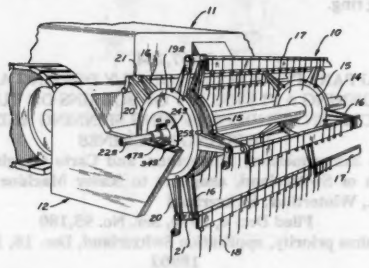
Filed Sept. 25, 1970, Ser. No. 75,533

Int. Cl. A01d *57/02*

U.S. Cl. 56—227 **10 Claims**

A mounting adaptor for attaching a harvesting reel to a swather, combine, or like harvesting machine. A typifying harvesting reel is a pick-up reel having a plurality of axially extending angularly spaced bats or members each equipped with a group of pick-up fingers maintained in a predetermined orientation as the reel structure is rotated so as to enter and engage a crop being harvested at a particular disposition with respect thereto. The pick-up reel includes a control hub rotatable with the reel about an axis offset from the axis of rotation thereof and connected with the bats and groups of fingers carried thereby to enforce the desired orientation thereon. The control hub is supported for rota-

tion by a control plate assembly having bearing structure rotatably supporting the axle of the reel structure and in turn being supported in the clamp collar of a mounting adaptor releasably and adjustably secured to the harvesting machine. The mounting adaptor accommodates dimensional differences in the reel support provided by any particular harvesting machine, and it enables the control plate assembly to be adjusted with facility to vary the disposition of the bats and pick-up fingers and thereby effect the most efficient coaction thereof with a crop to be harvested.



3,667,199

POWER-OPERATED LAWNMOWER WITH IMPROVED DISCHARGE MEANS

Leonard Bloom, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 26, 1970, Ser. No. 50,024
Int. Cl. A01d *35/26*
U.S. Cl. 56—320.2 **3 Claims**

A power-operated lawnmower has ground-engaging wheels supporting a deck housing. The deck housing encloses a plurality of rotary blades, preferably two in number. Each blade has a respective discharge channel formed within the deck housing. Each channel is preferably of the volute type and terminates in a respective lateral discharge opening. The discharge openings are formed along one side only of the deck housing, thereby providing improved safety and optimum removal of the grass cuttings.

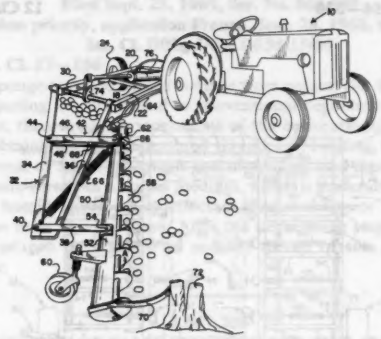
3,667,200

FRUIT AND NUT WINDROWER

Stuart D. Pool, Wheaton, and Harold G. Meitl, Clarendon Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 7, 1970, Ser. No. 61,963
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 R **1 Claim**

A fruit and nut windrower adapted for coupling behind a tractor and including an auger conveyor for gathering fruit or nuts on the ground and disposing the same into a windrow for subsequent pick-up. The conveyor is mounted for shifting movement laterally of the path of travel of the windrower in response to encountering ground obstructions. Means are provided for raising the conveyor from the ground to a transport position.

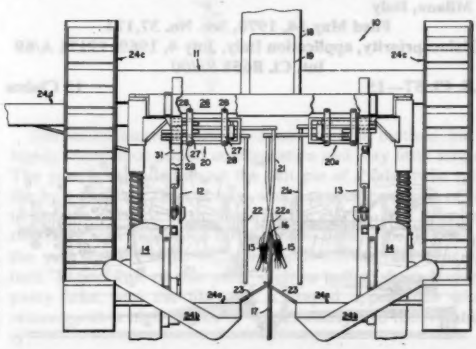


3,667,201

APPARATUS FOR HARVESTING FRUIT WITH AN ELLIPTICALLY MOVING STRIKER MEMBER

Gerald L. Claxton, and Darrell C. Horn, Lafayette, Calif., assignors to Up-Right, Inc., Berkeley, Calif.

Continuation-in-part of application Ser. No. 73,450, Sept. 18, 1970, now abandoned , which is a continuation-in-part of application Ser. No. 855,865, Sept. 8, 1969, now abandoned.
This application Dec. 28, 1970, Ser. No. 101,910
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **22 Claims**



A harvesting machine for use in harvesting fruit, such as grapes which grow on a longitudinal row of vines, in which the vines are struck with striker members to dislodge the fruit therefrom. The striker members are each translated through a generally elliptical, horizontal path as the machine moves along the row so that the speed of the striker member, into an out of the vines, transverse to the row, is maximized, and at the same time the longitudinal movement of the striker members relative to the vines during engagement therewith is minimized to prevent vine or fruit damage.

3,667,202

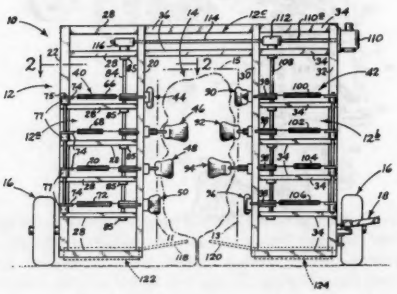
BEATER MECHANISM FOR AGRICULTURAL ROW CROP HARVESTER

John P. Watts, Route 2, P.O. Box 249, Hillsboro, Oreg.

Filed Feb. 3, 1971, Ser. No. 112,241

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 **12 Claims**



Beater mechanism for an agricultural row crop harvester. The mechanism includes a plurality of elongated beater members, each of which is pivoted for swinging, under power, into the path of plants (in a row), which plants move relative to the harvester as the latter travels over a field. The beater members have somewhat broom-like constructions, with each at its free end including a plurality of elongated side-by-side adjacent plant-engaging elements which strike stems in plants to dislodge produce.

3,667,203

WINDING MACHINE FOR COVERING A HOSE OF HIGH POLYMER WITH REINFORCING THREADS

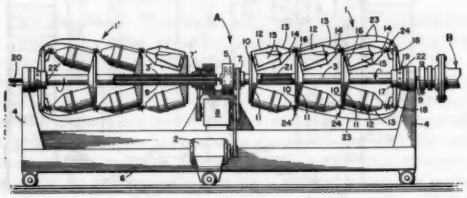
Bruno Koschatzky; Attilio E. Angioletti, and Nino Madonini, all of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milano, Italy

Filed May 14, 1970, Ser. No. 37,171

Claims priority, application Italy, July 4, 1969, 19171 A/69

Int. Cl. B65h *81/00*

U.S. Cl. 57—15 **13 Claims**



A thread winding machine having a rotation speed in excess of 600 r.p.m. consisting of a pair of axially aligned winding units oppositely rotatable by a single motor. Each unit has a rotatable hollow shaft through which a hose to be covered with the thread is passed and a group of containers for housing a fixed cone of thread which is disposed coaxially of the container and has a base spaced from the container wall, the containers being mounted and arranged around the hollow shaft, with their respective axes inclined relative to the shaft axis at an angle of from 10° to 20° and their bases disposed in close proximity to or in contact with one another. A conveying ring is mounted on the shaft at one end for guiding the threads which are paid out through openings in the containers to the hose. A guiding head is mounted on the shaft upstream of the conveying ring to operate the laying of the threads on the hose. Braking means is provided for each thread during its travel from a container opening to the conveying ring.

3,667,204

APPARATUS FOR CONJOINTLY DOFFING AND DONNING A PLURALITY OF BOBBINS OR TUBES PLACED ON SPINDLES OF RING SPINNING AND RING TWISTING MACHINES

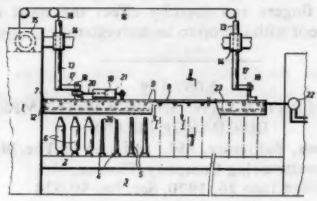
Ulrich Burgermeister, Winterthur, and Carlo Gaggini, Elgg, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Dec. 4, 1970, Ser. No. 95,180

Claims priority, application Switzerland, Dec. 18, 1969, 18902

Int. Cl. D01h *9/08*

U.S. Cl. 57—52 **16 Claims**



An apparatus for jointly doffing and donning a plurality of bobbins or tubes respectively, placed upon spindles of a ring spinning or ring twisting machine, which comprises a support member extending over a plurality of spindles, said support member being provided with stops arranged at a mutual distance from one another substantially corresponding to the spindle gauge. The stops protrude in the direction of the spindles. A hose member is supported on the side of the support member directed away from the stops, this hose member being deformable under the influence of a pressurized medium and serving to grip the bobbins or tubes brought between the hose member and the stops.

3,667,205

MECHANISM FOR WITHDRAWING AND WINDING YARN IN SPINNING UNITS

Ladislav Brazda, deceased, late of Cerveny Kostelec, Czechoslovakia (by Drahuska Brazdova and Dagmar Brazdova, heirs); Miloslav Prochazka, Nachod, Czechoslovakia; Vladimir Kuhn, Velke Svatonovice, Czechoslovakia, and Josef Ozdian, Cerveny Kostelec, Czechoslovakia, assignors to Elitex, Zavdy textilniho Strojirenstvi generalni reditelstui, Liberec, Czechoslovakia

Filed Mar. 9, 1970, Ser. No. 17,737

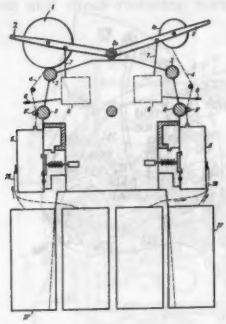
Claims priority, application Czechoslovakia, Mar. 7, 1969, PV 1695-69

Int. Cl. D01h *1/12, 7/00;* **B65h** *63/00*

U.S. Cl. 57—58.89 **11 Claims**

An open end spinning machine including a yarn winding apparatus having a driven rotatable drum, a bobbin mounting frame movable toward and away from the drum so that the bobbin may be selectively driven and undriven. In accordance with the invention there is provided means, shown as hand operated, for raising the bobbin from the drum, and means for adjustably retaining the frame and bobbin in elevated position, preferably with the surface of the bobbin

spaced only a small distance above the peripheral surface of the drum. Means, here shown as foot operated, is provided



for releasing the frame, when desired, whereby it is lowered so that the bobbin again rest upon and is driven by the drum.

3,667,206

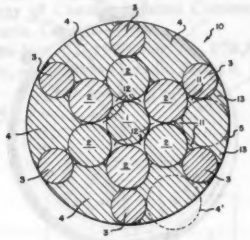
INTERLOCKED MULTI-WIRE MEMBER

William J. Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,765

Int. Cl. D07b *1/06*; D02g *3/36*; D07b *1/08*

U.S. Cl. 57—139 **8 Claims**



A multi-wire member in which the outer layer comprises alternate base and oversize wires wherein the oversize wires have been deformed into interlocking engagement with each other and with respect to the wires comprising the next underlying layer of the member to produce a smooth and substantially continuous outer surface.

3,667,207

CRIMPABLE COMPOSITE POLYAMIDE YARN

Victor Ralph Ben, Wilmington, Del., and Peter Steven Kay, Martinsville, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1970, Ser. No. 33,955

Int. Cl. D02g *3/02*

U.S. Cl. 57—140 BY **5 Claims**

A crimpable bicomponent filament in which one component is a polyamide and the other a random copolyamide containing specified percentages of three polymeric units. The different units and their concentrations are 70–82 percent hexamethylene adipamide, 13–25 percent caproamide and 5–17 percent hexamethylene dodecanedioamide. Yarns of one or more such filaments are particularly useful in the manufacture of hosiery because of their high crimpability, high strength and low shrinkage in the fabric.

3,667,208

PROCESS FOR OBTAINING A SPONGE-TEXTURED THREAD FROM NATURAL SILK THREAD

Marcel Marius Adrien Hilaire, Alba-Ardeche, France, assignor to Societe Forezienne de Moulinage et Texturation, Loire, France

Filed Sept. 25, 1969, Ser. No. 861,188

Claims priority, application France, Sept. 25, 1968, 6850428

Int. Cl. D02g *3/04*; D03d *15/00*

U.S. Cl. 57—156 **8 Claims**

Sponge-textured thread is made from natural silk thread by subjecting the silk thread to conventional degumming operations, then to known operations of the conventional method of obtaining a sponge-textured thread; i.e., twisting, fixing by thermal or steam treatment and untwisting, and then placing the silk thread in a humid medium, which is preferably hot. If the humid treatment is effected after weaving or knitting, these must be very loose. After the degumming step the silk thread can be coupled to another thread of silk or other fiber.

3,667,209

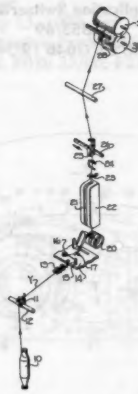
METHOD OF FALSE-TWISTING MULTIFILAMENT YARN

Bobby Ray Fain, Burlington, N.C., assignor to Alamance Industries, Inc., Burlington, N.C.

Filed Oct. 16, 1970, Ser. No. 81,205

Int. Cl. D02g *1/02*

U.S. Cl. 57—157 TS **6 Claims**



The multifilament yarn produced by this method has a highly crimped or curled configuration and very little torque. The yarn is threaded about the exit pin of a false-twist spindle by a slip-knot type of loop which prevents passage of the twist from one side to the other of the exit pin and permits a relatively high number of turns of false-twist to be inserted in the yarn, on the order of from about 150 to 185 turns per inch. Fabric knit of this yarn, such as ladies' sheer hosiery, panty hose, and the like, has a creped appearance when relaxed with a high degree of stretchability and recoverability.

3,667,210

HOROLOGICAL INSTRUMENT

Heinz Meitinger, Pforzheim, Germany, assignor to Timex Corporation, Waterbury, Conn.

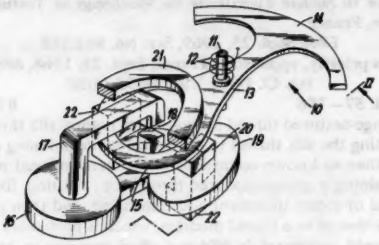
Filed July 6, 1970, Ser. No. 47,842

Int. Cl. G04c *3/04*; H02k *33/10*

U.S. Cl. 58—28 B **12 Claims**

A horological instrument includes an oscillator such as a balance wheel. The oscillator carries a coil, which may consist of a single conductive ring. Current is induced in the

moving coil by mutual induction from a fixed coil. One or more fixed magnetic fields are positioned to drive the energized coil. A circuit is provided to energize the coil with current at the proper moment during its oscillation.

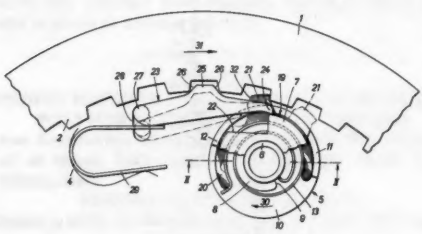


3,667,211

DRIVE MECHANISM FOR AN INDICATOR OF THE DAY OF THE MONTH IN A TIMEPIECE

Jean-Claude Schneider, La Chaux-de-Fonds, Switzerland, assignor to Fabrique d'Horlogerie Chs. Tissot et fils S.A., Le Locle Canton of Neuchatel, Switzerland

Filed Nov. 2, 1970, Ser. No. 85,992
Claims priority, application Switzerland, Nov. 3, 1969, 16355/69
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **17 Claims**



In a timepiece having a date indicator, the driving mechanism therefor is connected to the 24-hour wheel, which is driven by the movement, through a spiral spring which gradually stores energy from the rotation of the 24-hour wheel and imparts the stored energy to the driving mechanism to advance the date indicator when the blocking mechanism restraining improper movement of the date indicator is released.

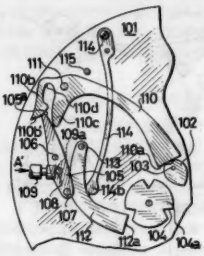
3,667,212

RESETTING-TO-ZERO MECHANISMS FOR SECONDS, MINUTE, AND HOUR HANDS

Katsuhiko Komiyama, and Yoshio Iinuma, both of Tokyo, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 19, 1971, Ser. No. 134,944
Claims priority, application Japan, Apr. 20, 1970, 45/32975; June 4, 1970, 45/55024; June 5, 1970, 45/55602
Int. Cl. G04f *7/04*
U.S. Cl. 58—74 **5 Claims**

In a timepiece wherein the second, minute and hour hands are rotated about a common axis, an externally operated hand position resetting arrangement is provided for shifting a second hand connection lever and a minute and hour hand correction lever into engagement with respective cams to accomplish the resetting of the hands to a zero position.

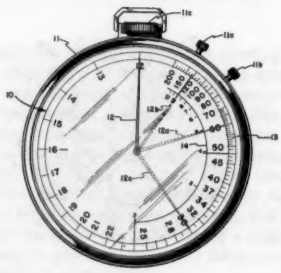


3,667,213

PULSE, RESPIRATION AND INTRAVENOUS RATE COUNTER

John D. Ensign, Brigham City, Utah, assignor to Measurement Science Corporation, Brigham City, Utah

Filed Dec. 11, 1970, Ser. No. 97,077
Int. Cl. G04b *19/00*
U.S. Cl. 58—126 R **1 Claim**



A rate counter consisting of scales scribed on a circular chart forms the dial face of a sweep second hand stop watch, a specified number of counts of a patients pulse beats or respiratory motions or a specified number of drops from an intravenous apparatus are observed, and the stop watch is operated to stop the second had. The stopped second hand is positioned directly opposite a scale providing a direct read out of the patients pulse or respiration rate per minute or the number of cubic centimeters per hour passing from an intravenous apparatus.

3,667,214

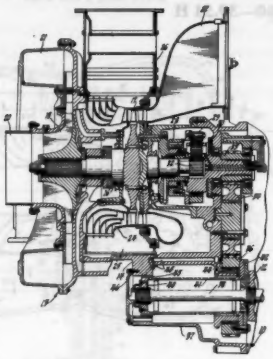
ENGINE TURBOSUPERCHARGER WITH VIBRATION REDUCING DRIVE

Albert N. Addie, La Grange Park, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1970, Ser. No. 18,523
Int. Cl. F02b *41/10*; F16d *3/12*
U.S. Cl. 60—13 **5 Claims**

A turbosupercharger for an internal combustion engine has a speed-increasing drive train to drive the compressor at a

predetermined minimum multiple of engine speed and an overrunning clutch to permit the compressor to be driven at higher speeds by the engine exhaust gases. The turbosupercharger housing provides for the alternative use of two torsional vibration and shock-reducing means in the drive



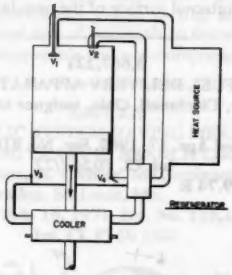
train, one such means comprising an internally mounted engine oil lubricated quill shaft drive and the other such means comprising the combination of an internally mounted engine oil lubricated quill shaft drive arranged in parallel with an externally mounted viscous damper utilizing a silicone damping fluid or the like.

3,667,215

HEAT ENGINES

Venkataramanayya K. Rao, Bangalore, India, assignor to Atomic Energy of Canada Limited Commerical Products, Ottawa, Ontario, Canada

Filed Nov. 21, 1969, Ser. No. 878,817
Claims priority, application Canada, Feb. 14, 1969, 042,928
Int. Cl. F03g 7/06
U.S. Cl. 60—24 **7 Claims**



There is provided a gas cycle which is of particular usefulness in the utilization of heat which is not of relatively high temperature. An engine operating with the subject gas cycle may use thermal energy derived from Radioisotope decay.

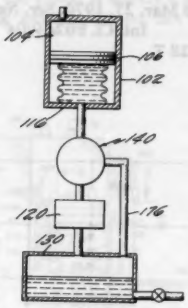
3,667,216

PRESSURIZATION SYSTEM

Victor A. De Mattia, Jr., East Longmeadow, Mass., and Vincent J. Sansevero, Jr., East Hartford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 27, 1968, Ser. No. 763,221
Int. Cl. C06d 5/04
U.S. Cl. 60—37 **3 Claims**

A pressurization system for supplying a constant pressure source including a liquid propellant source, a reaction chamber for disposing the liquid propellant into a gasified product, a storage tank for storing the gasified products and



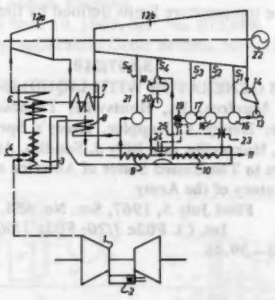
a feedback system for maintaining the output pressure from the storage tank.

3,667,217

STEAM GAS TURBINE INCLUDING A GAS TURBINE AND A STEAM TURBINE WITH A STEAM GENERATOR AT THE DOWNSTREAM END

Jean Vidal, Ville D'Avray; Jean Parisot, and Jacques Lemoine, both of Paris, all of France, assignors to Stein Industrie, Paris, France

Filed May 13, 1970, Ser. No. 36,816
Claims priority, application France, May 14, 1969, 6914168
Int. Cl. F01k 23/06; F22d 1/12
U.S. Cl. 60—39.02 **4 Claims**



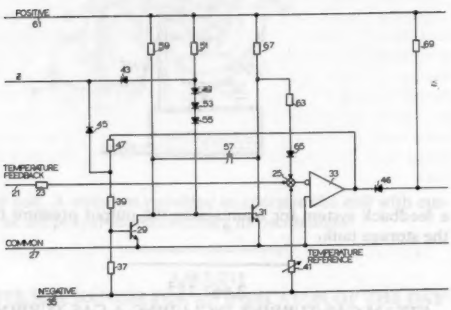
A steam gas plant including a gas turbine the exhaust gases of the gas turbine feed the burners of the steam generator which in turn feeds the steam turbine, a steam generator, and a steam turbine, in which the operation of the gas turbine continues under full load even for reduced loads on the steam turbine. The invention maintains under varying steam turbine loads the temperature at the input of a deaerator constant, the deaerator being fed in parallel by an economizer subjected to the heat of the flue gases of the steam generator and by water heaters fed with steam extracted from the turbine. To ensure constant temperature, one of the streams feeding the deaerator is controlled by a gate the extent of opening of which is defined by the ratio of the throughput of flue gases acting on the economizer and the flow of water in the economizer and possibly also by the modifications in the temperature at the output of the economizer.

3,667,218

GAS TURBINE TEMPERATURE ADAPTIVE CONTROL

Richard K. Davis, Roanoke, Va., assignor to General Electric Company

Filed Mar. 27, 1970, Ser. No. 23,372
Int. Cl. F02c 9/04
U.S. Cl. 60—39.28 T 5 Claims



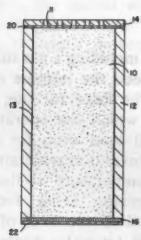
A temperature adaptive control system for controlling the rate of fuel flow to a gas turbine having sensors in the path of the exhaust gases which produce an electrical feedback signal proportional to temperature. Another signal, proportional to maximum allowable temperature, normally opposes the feedback signal at a summing junction. A third coacting signal forms an envelope and varies indirectly with the temperature of the turbine over a predetermined period of time at the end of which it is reduced to zero, causing the fuel flow to increase the maximum controlled rate without exceeding the temperature limits defined by the third signal.

3,667,219

GAS GENERATOR WITH LIQUID INITIATOR

James A. Murfree, Jr., Huntsville; Theodore N. Hubbuch, Florence; Henry A. Nappier, Lacey's Spring; William A. Duncan, Huntsville, and Billy J. Sandlin, Athens, all of Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed July 5, 1967, Ser. No. 651,327
Int. Cl. F02c 3/20; F02g 1/00
U.S. Cl. 60—39.46 10 Claims



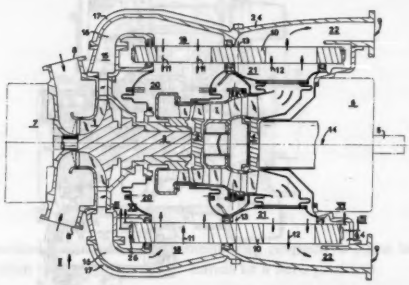
Porous support materials such as porous firebrick and unglazed clay plate having suspended therein a liquid initiator (oxidizing agent) for gas generators employing exothermally decomposing monopropellants.

3,667,220

GAS TURBINE WITH ROTARY HEAT EXCHANGERS

Lucien Dekeyser, Chelles, France, assignor to Bennes Marrel, Saint-Etienne (Loire), France

Filed Mar. 31, 1970, Ser. No. 24,253
Claims priority, application France, May 22, 1969, 6915549
Int. Cl. F02c 7/10; F28d 19/04
U.S. Cl. 60—39.51 H 7 Claims



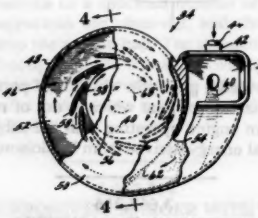
A gas turbine of the type having a pair of rotary heat exchanger discs mounted for rotation about a common axis transverse to the main axis of the turbine on opposite sides thereof is provided with a drive arrangement which will provide for expansion between the disc and an annular drive ring surrounding the disc. The annular drive ring is provided with a plurality of external teeth disposed in meshing engagement with a pinion drivingly connected to the main gear box of the turbine. A plurality of cylindrical rods are mounted in a plurality of equally spaced apart grooves in the circumference of each of the discs. Each cylindrical rod is formed with an arcuate groove in the external surface thereof for the reception of a key member having a convex surface which rests in the arcuate groove and two plain surfaces which define a dihedron, the edge of which is disposed adjacent the internal surface of the annular ring. A pair of wedge members are disposed in engagement with each of the surfaces of the key. The wedges are biased into engagement with the key by means of a spring extending between the wedge and a rib formed on the internal surface of the annular ring.

3,667,221

FUEL DELIVERY APPARATUS

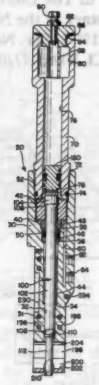
Jack R. Taylor, Cincinnati, Ohio, assignor to General Electric Company

Filed Apr. 17, 1969, Ser. No. 816,985
Int. Cl. F02c 7/22
U.S. Cl. 60—39.74 R 2 Claims



Apparatus is disclosed for premixing air and fuel or carbureting air prior to introduction thereof into the primary zone of a combustor, said apparatus including a housing defining a spin chamber therein; the spin chamber is adapted to receive air and fuel and vaporize and/or atomize said fuel and deliver said air and fuel into said combustor as a vortical flow.

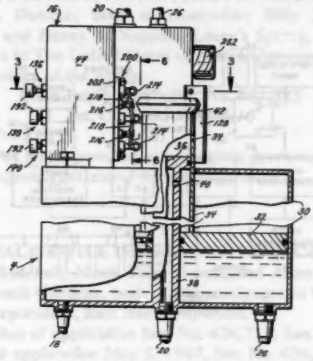
3,667,222
POWER DEVICE
Oliver E. Saari, Niles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed July 22, 1970, Ser. No. 57,245
Int. Cl. F15b *3/00*
U.S. Cl. 60—51 **5 Claims**



A power device having a power reservoir in which a compressible fluid is maintained under pressure, an accumulator piston and a drive piston which are simultaneously movable to retracted or cocked positions by the introduction of a non-compressible power fluid into a cylinder in which the pistons are reciprocably movable, the power fluid acting on exposed areas of the drive piston to move it with the accumulator piston until it reaches its fully cocked position whereupon further movement of the accumulator piston exposes additional areas of the drive piston to the pressure of the power fluid whereby the compressible fluid, acting through the power fluid, imparts drive movement to the drive piston and multiple seal means on said accumulator piston, reservoir means in said accumulator piston to trap any power fluid which has by-passed one of said seals to thereby avoid intermixing of said compressible and non-compressible fluids.

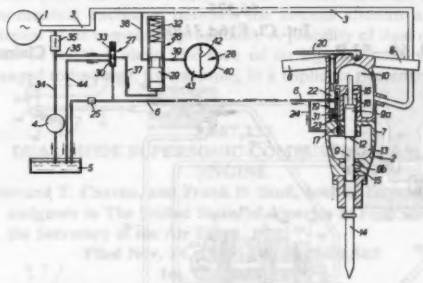
3,667,223
HYDRAULIC SYSTEM HAVING MEANS FOR ISOLATING LEAKING BRANCH CIRCUITS
Charles T. Thurston, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Feb. 16, 1971, Ser. No. 115,256
Int. Cl. F15b *1/00*
U.S. Cl. 60—51 **11 Claims**

A hydraulic system has a reservoir which contains a hydraulic fluid and includes a piston which bears against that fluid. The system also has a pump which derives fluid from the reservoir and supplies high pressure fluid to a plurality of branch circuits, each having a hydraulic motor or some other hydraulically powered device or load. The branch circuits are connected to the reservoir so that fluid after passing through the hydraulic motors is returned to the reservoir at low pressure. An isolating apparatus is interposed between the pump and branch circuits and includes a main valve for isolating each branch circuit. Each main valve is normally open, and is controlled by a pilot valve which is in turn operated by a cam follower disposed in the path of a cam which is carried by and responsive to the position and movement of the reservoir piston. Should one of the branch circuits develop a leak, the volume of the fluid in the reservoir will decrease, causing the piston to move through the reservoir and carry its cam with it. The cam, by operating the pilot valves associated with the main valves, shuts off and opens the main valves sequentially until the main valve associated with the leaking branch is closed, at which time loss of reservoir fluid terminates and further movement of the piston is merely a function of normal system operating conditions and not leakage. Once



operated by the cam the pilot valve for the leaking branch circuit is pressure loaded or mechanically held in a position to isolate the branch from the remainder of the system in which case the pilot valve is independent of cam position.

3,667,224
POWER TRANSMISSION SYSTEMS
Keith Foster, Birmingham, England, assignor to A. F. Hydraulics Limited, c/o National Research Development Corporation, London, England
Filed Nov. 10, 1969, Ser. No. 875,098
Claims priority, application Great Britain, Nov. 11, 1968, 53,416/68
Int. Cl. F03c *1/00*; F15b *1/02*
U.S. Cl. 60—51 **8 Claims**

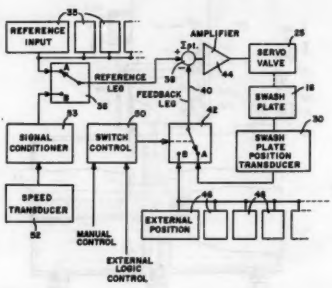


A so-called A.F. or "alternating flow" hydraulic system comprises a power line interconnecting a generator and a pressure chamber of a receiver, a return line, control valve means at the receiver end of the system and operative to interconnect said power and return lines whereby to produce a return hydraulic flow through the return line, and control means at the generator end of the system. The control means sense the change of flow conditions consequent upon operation of the valve means and substantially preventing pressure pulses from the generator reaching at least a major length of the power line connected to the receiver.

3,667,225
HYDROSTATIC DRIVE AND CONTROL SYSTEM THEREFOR

Lawrence P. Karman, Waynesville, Ohio, assignor to Scott Equipment Company, Dayton, Ohio

Filed Aug. 12, 1970, Ser. No. 63,218
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 VS **1 Claim**

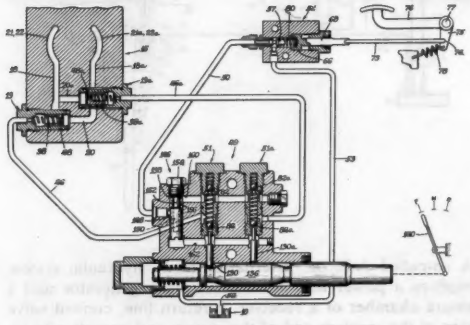


An electro-hydraulic system controls the position or movement of a fixed displacement hydraulic motor, such as a piston motor, in accordance with predetermined desired rates of movement or positions thereof, and employs a variable displacement drive pump having a movable swash plate. The position of the swash plate is controlled by an electrical control circuit including a series of inputs which represent either a desired position of the motor or a desired pump output. Means are provided for selecting between primary feedback indicative of the position of the swash plate or secondary feedback indicative of the position of the motor or device being controlled.

3,667,226
CONTROL FOR A HYDROSTATIC TRANSMISSION

Rodger W. Asmus, Downers Grove, and William R. Borghoff, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 13,856, Feb. 24, 1970, abandoned, which is a continuation of application Ser. No. 731,590, May 23, 1968, now abandoned. This application Nov. 2, 1970, Ser. No. 86,375
Int. Cl. F16d *31/06*
U.S. Cl. 60—53 R **8 Claims**

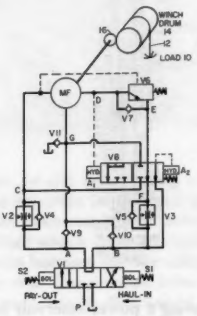


For a hydrostatic transmission having valving means which can be selectively positioned corresponding to forward, neutral, and reverse drive of the transmission and including means for dumping excess fluid pressure from the fluid pressure circuit in order to prevent damage to the transmission, and under certain conditions to prevent overspeeding of the transmission to further prevent damage; means are provided whereby fluid flow in a hydrostatic loop can be bypassed from its normal drive path in the transmission, through the valve means provided.

3,667,227
HYDRAULIC LOAD LIMITING SYSTEM

Jerome Bentkowsky, Los Altos, and W. Tait Beran, Palo Alto, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 5, 1971, Ser. No. 121,330
Int. Cl. F16d *31/06*
U.S. Cl. 60—53 WW **7 Claims**

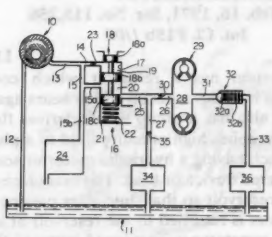


Apparatus for limiting the load on a hydraulic drive system, such as a winch. A feature of the disclosed arrangement is that limiting is maintained at a relatively constant value regardless of whether the load is being controlled by the hydraulic drive or is overpowering the drive.

3,667,228
LUBRICATING CIRCUIT OF AN AUTOMOTIVE POWER TRANSMISSION

Koichi Ohie, Tokyo, and Koji Enomoto, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 5, 1970, Ser. No. 87,072
Claims priority, application Japan, Nov. 12, 1969, 44/90672
Int. Cl. F16d *31/06*; F16h *41/02*
U.S. Cl. 60—54 **3 Claims**



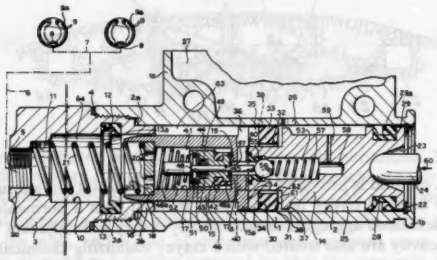
An automotive power transmission lubricating circuit which is supplied with a lubricating fluid from an oil pump delivering a pressurized fluid for operating the transmission, the lubricating fluid being drawn to the lubricating circuit from a passage upstream of a torque converter, whereby the lubricating circuit can be supplied with a lubricating fluid at any desired flow rate which is not influenced by the operation of the torque converter throughout different operations of the transmission.

3,667,229

DEVICE FOR SUPPLYING FLUID UNDER PRESSURE

Arturo Cresto, Turin, Italy, assignor to Ferruccio Manzini, Turin, Italy

Filed Dec. 15, 1969, Ser. No. 884,890
Claims priority, application Italy, Dec. 18, 1968, 54336 A/68
Int. Cl. F15b 7/00, 7/08
U.S. Cl. 60—54.6 A 12 Claims



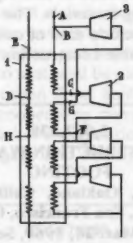
A device for supplying fluid under pressure has a two-part cylinder, one part being of narrower diameter than the other, and a two-part piston slidable in the cylinder. Two pressure chambers are defined by the cylinders and the piston. Advance of the piston reduces the volume of both. One, the high pressure chamber feeds an external pressure system, and is itself fed by the other chamber through a valve system during an initial phase of the piston stroke. In a later phase the feed from the second in the first chamber ceases and instead the second chamber feeds the fluid reservoir through a control valve. Pressure-transmitting means such as a rod is arranged between the high pressure chamber and the control valve to open the control valve when the pressure in the high pressure chamber exceeds a predetermined value.

3,667,230

PROCESS FOR THE RATIONAL EXCHANGE OF HEAT IN COUNTER-CURRENT HEAT EXCHANGES WHERE THE EXCHANGES ARE UNBALANCED

Jacques Sterlini, Paris, France, assignor to Compagnie-Electro-Mecanique, Paris, France

Filed Jan. 26, 1971, Ser. No. 109,894
Int. Cl. F01d 13/02
U.S. Cl. 60—65 7 Claims



The coupling of quantities of heat by exchange between two fluids is obtained by dividing the hot fluid into two streams at the entrance of a heat exchanger; the first stream is introduced into the high temperature portion of the exchanger and is then passed to a turbine for reduction in pressure while producing work energy; the second stream being introduced into a turbine for reduction in pressure while producing work energy and is then passed to the heat exchanger at substantially the temperature at which the first stream leaves the heat exchanger. The excess heat which is available in the hot fluid and cannot be stored for reheating the other fluid is thus converted into work energy.

3,667,231

HYDRAZINE DECOMPOSITION PROCESS USING METAL PROMOTERS

Theodore N. Hubbuch, Florence; James A. Murfree, Jr.; William A. Duncan, both of Huntsville; Billy J. Sandlin, Athens, and Henry A. Nappier, Lacey's Spring, all of Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed July 5, 1967, Ser. No. 651,323
Int. Cl. C06d 5/04, 5/10
U.S. Cl. 60—218 5 Claims

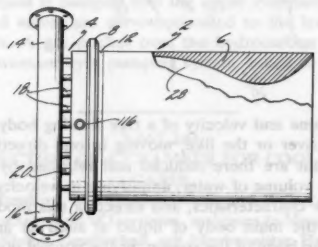
The use of metal powders as synergistic promoters for solid oxidizing agents (initiators) for gas generators.

3,667,232

DUAL ORIFICE IMPINGEMENT INJECTOR

James P. Mitchell, North Palm Beach, and Allan R. Cohen, Palm Beach Gardens, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of application Ser. No. 426,711, Jan. 15, 1965.
This application May 5, 1967, Ser. No. 636,551
Int. Cl. F02k 9/02
U.S. Cl. 60—258 8 Claims



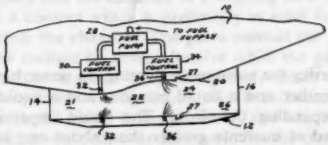
An injector head having nozzle assemblies with each assembly being formed with dual coaxial orifices. Streams formed by dual orifices of different propellants being directed to impinge at a point within a propellant mixing zone. Each nozzle assembly of dual orifices maintaining by a momentum exchange between the coaxial streams a single stream of its respective propellant. A plurality of dual orifices can be located about the face of an injector head and arranged to impinge, for example, in a triplicate pattern.

3,667,233

DUAL MODE SUPERSONIC COMBUSTION RAMJET ENGINE

Edward T. Curran, and Frank D. Stull, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 14, 1969, Ser. No. 870,545
Int. Cl. F02k 7/08
U.S. Cl. 60—270 4 Claims



A supersonic ramjet engine having a fixed-geometry combustion chamber. The ramjet engine is operated in the sub-

sonic mode by injecting fuel in fuel injectors located in a uniform cross-section portion of the combustion chamber and in the supersonic mode by injecting fuel in fuel injectors located upstream of the subsonic injectors in an adjacent expanding portion of the combustion chamber.

3,667,234

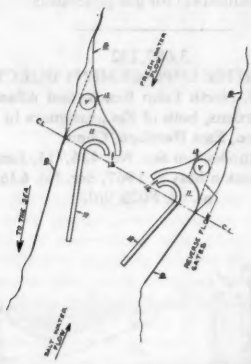
REDUCING AND RETARDING VOLUME AND VELOCITY OF A LIQUID FREE-FLOWING IN ONE DIRECTION

Gabriel V. De Lizasoain, Boca Raton, Fla., assignor to Tecnico, Inc., Washington, D.C.

Filed Feb. 10, 1970, Ser. No. 10,205

Int. Cl. E02b *3/00*

U.S. Cl. 61—1 R **4 Claims**



The volume and velocity of a free flowing body of water, such as a river or the like, moving in one direction past a control point are there reduced and retarded by diverting part of the volume of water, amplifying its velocity, linearizing its flow characteristics, and directing this modified flow back into the main body of liquid at such an angle as to create in the body of the stream, at the control point area, a zone of compound flows which through turbulence, drag, and other fluid phenomena materially obstruct and retard the flow through the control area.

3,667,235

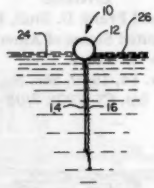
CONVERTIBLE BARRIER FOR SUBSTANCES FLOATING ON WATER

Paul Preus, P.O. Box 1002, Toms River, N.J., and John J. Gallagher, 252 Burley Road, Annapolis, Md.

Filed Apr. 27, 1971, Ser. No. 137,799

Int. Cl. B63b *35/00*

U.S. Cl. 61—1 **6 Claims**



A barrier for substances floating on water having a flotation member and a liquid pervious and a liquid impervious skirt depending therefrom. The liquid impervious skirt is deflected at currents greater than about one knot and the oily substances are treated with a particulate oleophilic-hydrophobic substance less dense than water for retention by said liquid pervious skirt.

3,667,236

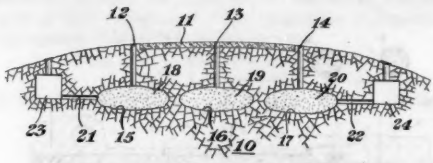
METHOD FOR TREATING SUBSURFACE SOILS

Robert B. Rosene, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 10, 1970, Ser. No. 45,035

Int. Cl. E02d *19/16, 27/16*

U.S. Cl. 61—11 **4 Claims**



A method is provided for increasing the stability of subsurface soils. A cavity in the subsoil is filled with a permeably consolidated aggregate and optionally clayey soils adjacent to the cavity are also treated with a clayey stabilizing chemical.

3,667,237

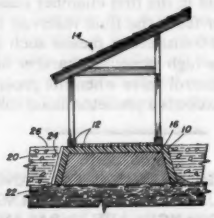
NOVEL CONSTRUCTIONS AND METHODS

Thomas P. Dougan, Corona Del Mar, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 5, 1970, Ser. No. 61,356

Int. Cl. E02d *3/00*

U.S. Cl. 61—36 **18 Claims**



An improved construction is disclosed which utilizes a frozen surface as a support means. The improvement comprises a thermal barrier interposed between the base portion of the construction and the frozen surface. The thermal barrier functions to stabilize the frozen surface by prevention of its thawing, thus maintaining support capacity. The thermal barrier can be of rigid plastic foam materials, such as polyurethane foam or a composite of said rigid plastic foams with other thermal insulating materials. The advantages of the improved construction include ease of construction, lower cost, and production of a stable construction upon normally unstable surfaces.

3,667,238

STABILIZED CONSTRUCTION WALL IN UNSTABLE FOOTING

Ben C. Gerwick, Jr., Oakland, Calif., assignor to J. H. Pomeroy & Co., Inc., San Francisco, Calif.

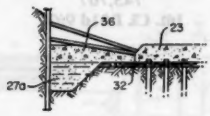
Original application Mar. 28, 1969, Ser. No. 811,331, now Patent No. 3,563,044. Divided and this application May 15, 1970, Ser. No. 37,747

Int. Cl. E02d *3/12, 5/18, 27/04*

U.S. Cl. 61—39 **1 Claim**

An arrangement for providing stabilization for a construction wall during construction in an unstable footing which includes the formation of a basin above the pre-existing surface level of a proposed construction zone or site. The basin is used to receive fluid therein to provide increased hydrostatic pressure, acting on the wall from inside the construction site

to provide pressure within the site to a degree approximating the counter-vailing pressures acting on the construction wall from outside the site. Then, while maintaining the hydrostatic pressure, the soil materials within the site are removed by excavating down to a predetermined level and replaced (while still maintaining the hydrostatic pressure) with a stabilizing fill material of greater strength than the unstable materia removed from the site. Thereafter, the hydrostatic pressure



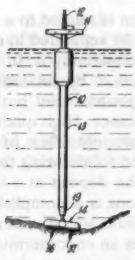
can be relieved and preparation of the site continued. The wall structure formed will ultimately be characterized by an unstable footing material on one side of the wall at the lower end thereof, a mat of stable footing material on the other side of the wall, and a mat of concrete superimposed upon the mat of stabilized footing material so that the concrete mat can counteract laterally acting forces pressing against the outside of the wall.

3,667,239

ANCHOR FOR BUOYANT MARINE STRUCTURES

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,395
Int. Cl. B63b *35/44, 21/50*
U.S. Cl. 61—46.5 **10 Claims**



The invention relates to a buoyant marine platform for positioning in a deep water offshore location. The platform includes buoyancy control means whereby to regulate the attitude of the unit at the water's surface as well as when submerged. The platform lower end is provided with an anchoring member adapted to seat, and be partially imbedded into a sloping or contoured ocean floor. Said anchor member comprises separate, yet cooperating components which permit adjustment of the anchor's disposition while at the ocean floor, to operably engage and fixedly position the buoyant platform.

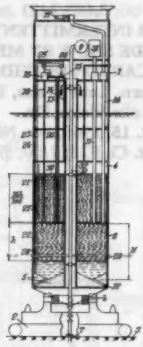
3,667,240

INSTALLATIONS FOR SUBMARINE WORK

Robert H. Vilain, Maisons-Alfort, France, assignor to Compagnie Francaise D'Entreprises Metalliques, Paris, France, a part interest

Filed Nov. 20, 1969, Ser. No. 878,458
Claims priority, application France, Nov. 21, 1968, 174812
Int. Cl. E02b *17/00;* E21b *15/02*
U.S. Cl. 61—46.5 **9 Claims**

An off-shore drilling platform for hydrocarbons has an oscillating column pivoted at its base and kept stable by upward hydrostatic pressure, with hydrocarbon storage in the column. The difference in the densities of water and hydrocarbons in the column is compensated whereby the forces acting on the base of the column and on the pivot remain substantially constant. The column has two compartments, a lower one filled with water, and an upper one forming a float. Compensating means are pumps and valves ar-



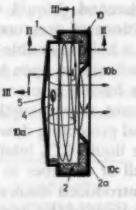
ranged so that when the hydrocarbon is introduced into the lower compartment it drives out water and corresponding mass of liquid is pumped into the upper compartment. The pumps and valves are servo-controlled to the levels of the two liquids. A gas pocket over the hydrocarbon is kept at constant pressure by a pumping system linked to the servo-control.

3,667,241

CONSTRUCTION OF A CHAMBER FOR COOLING HOT GASES

German Munding, Bad Friedrichshall, and Willi Zeh, Neuenstadt, Kocher, both of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

Filed Mar. 3, 1970, Ser. No. 16,006
Claims priority, application Germany, Mar. 5, 1969, P 19 11 078.2; June 19, 1969, P 19 30 990.1
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 **14 Claims**



A construction of a chamber for cooling hot gases such as fuel gases or combustion gases includes means for introducing the hot gases into the chamber in a whirling flow and into contact with a coolant which is preferably in solid form and is located within the chamber. The gases contact the coolant and cause the coolant to slowly dissolve while the gases are cooled down. The coolant is advantageously made of a L-shaped cross-sectional configuration and it includes a wall which surrounds the outlet to the chamber, and which forms, with the chamber wall, an over flow weir for the outflow of the gases after they have been cooled within the chamber. The coolant itself advantageously includes means such as longitudinally extending grooves for forming rotatable eddies

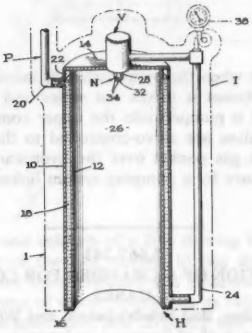
on the whirling gas flow which intensify the heat exchange between the relatively cooled boundary layer and the hotter rotating layers of the whirling gas flow located further inside radially. In another embodiment the coolant chamber advantageously includes a front wall or closed wall located opposite the outlet which carries the coolant lining in a solid form.

3,667,242

APPARATUS FOR INTERMITTENTLY PRODUCING CARBON DIOXIDE SNOW BY MEANS OF LIQUID CARBON DIOXIDE

Robert William Kilburn, Lake Wales, Fla., assignor to RWK Development Co., Lake Wales, Fla.

Filed Sept. 15, 1969, Ser. No. 857,743
Int. Cl. F25j *1/00, 5/00*
U.S. Cl. 62—10 **12 Claims**



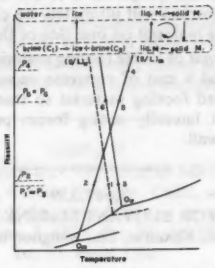
Apparatus particularly embodying an improved snow horn for producing carbon dioxide snow in a controlled intermittent manner upon demand. Liquid CO_2 is directed under predetermined conditions of pressure and temperature into an upper portion of a hollow double side walled cylindrical horn member provided with an open bottom and preferably a closed top, the latter having a solenoid actuated dispensing valve disposed adjacent thereto with an expansion nozzle connected thereto and projecting down into the horn. An annular area above the liquid CO_2 inlet in the horn is utilized within the hollow well or chamber to collect bubbles of CO_2 gas which may be introduced therewith. The liquid CO_2 is removed from the bottom of the annular chamber to assure exit therefrom only of the liquid CO_2 as by insulated pipe and introduced into the nozzle via the solenoid valve. The nozzle via minute holes therein preferably imparts a swirling tangential movement to the CO_2 snow formed by the sudden expansion of the liquid CO_2. The liquid CO_2 entering in the annular chamber is subcooled by the tangential swirl or vortex-like action of the mixture of snow and gas, to an extent to cause any bubbles in the liquid CO_2 to condense back into liquid form. The overall arrangement thereby assures that only liquid CO_2 enters the expansion nozzle to assure positive controlled formation of CO_2 snow at all times, even though the action of the solenoid dispensing valve is intermittant and/or off for considerable periods of time.

3,667,243

INDIRECT-FREEZING PROCESS WITH HEAT REUSE BY AN AUXILIARY WORKING MEDIUM

Chen-Yen Cheng, 2443 South Krameria Street, Denver, Colo., and Sing-Wang Cheng, 83, Section 1, Chang-an East Road, Taipei, China /Taiwan

Continuation-in-part of application Ser. No. 683,800, Nov. 17, 1967, which is a continuation-in-part of application Ser. No. 346,112, Feb. 20, 1964, now Patent No. 3,354,083, dated Nov. 21, 1967. This application July 10, 1968, Ser. No. 743,707
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **5 Claims**



Phase diagrams illustrating $(S/L)_a - (S/L)_m$ couplings.

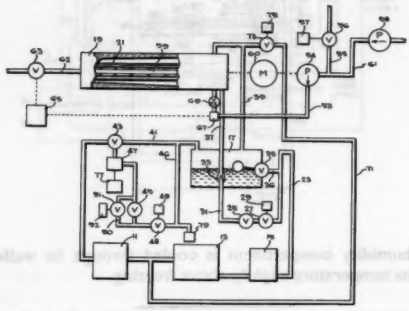
The present invention is related to a separation process by which a substance can be separated in a more or less purified state from a solution containing it. In the process, the solution is partially solidified by an indirect contact cooling operation and the deposited solid is then melted in situ to yield the purified substance. High quality deposit is obtained by maintaining an appropriate flow of the solution over the surface of the deposited solid during the solidification operation and by growing the deposit at a low growth rate. Heat reuse in these operations is accomplished by the help of an auxiliary working medium which undergoes a cyclic change. The medium undergoes an endothermic transformation, such as melting, vaporization, etc., to absorb the heat liberated during the partial solidification operation and undergoes the corresponding reverse operation, which is exothermic, to supply the heat required in melting the deposited solid. Since the transformation temperatures of both the main system and the auxiliary system during the operations described above are functions of the respective applied pressures, the temperature differentials required in these heat exchange operations between the main and the auxiliary systems can be obtained by selecting a suitable working medium and by maintaining the pressure applied to these systems during the operations or appropriate values. Work is supplied to the process through the necessary pressurization operations.

The working medium used may undergo a set of solid liquid transformations, a set of liquid vapor transformations, or any other reversible transformations. When a rigid wall is used to separate the medium from the main system, the pressures applied to them may be different at a given time. However, when a deformable vessel is used to separate the two systems. both systems are maintained substantially at the same pressure at any given time. The processes of the present invention are classified according to the nature of transformations of the working medium and the nature of the wall separating the two systems. The equipments which can be used in these processes are also described.

3,667,244
CONTROL SYSTEM FOR FREEZERS

Walter L. Hock, Skokie, Ill., and William E. Meyers, Monroe, N.C., assignors to Kraftco Corporation, New York, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,284
Int. Cl. F25c 7/14
U.S. Cl. 62—136 7 Claims

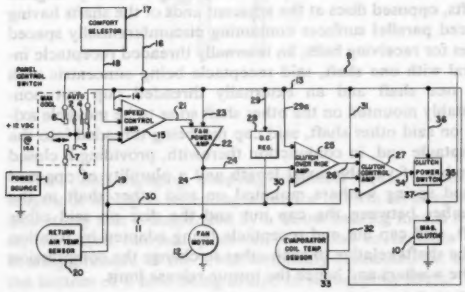


The present invention is directed to a freezing system of the hot gas type and a control system therefor. The freezing system is particularly directed to the type wherein a single motor is used to drive a dasher for a mix pump or pumps. The control system of the invention includes timing devices for controlling the start-up and shut-down of the freezing system in accordance with a predetermined sequence.

3,667,245
FAN AND CLUTCH CONTROL CIRCUIT FOR AN AIR CONDITIONER

James Peter Till, 341 Blacklatch Lane, Camp Hill, Pa., and William Jeffrey Hudson, Jr., R.D. #1, P.O. Box 115, Hummelstown, Pa.

Filed June 8, 1970, Ser. No. 44,493
Int. Cl. F25d 17/00
U.S. Cl. 62—180 9 Claims

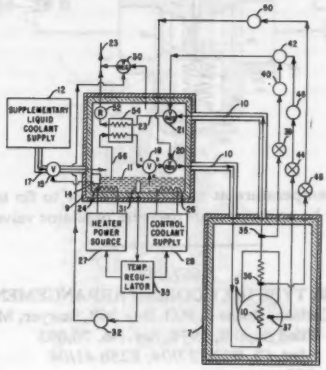


A fan and clutch control circuit controls the operation and speed of a fan of an air conditioner over a preselected temperature range and controls the operation of a magnetically operated clutch to drive a compressor of the air conditioner at selected temperatures.

3,667,246
METHOD AND APPARATUS FOR PRECISE TEMPERATURE CONTROL

Steven J. St. Lorant, San Mateo, Calif., and Phillip L. Dow, Geneva, Switzerland, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 4, 1970, Ser. No. 95,237
Int. Cl. F25b 41/00
U.S. Cl. 62—208 7 Claims



A temperature control system for maintaining a cryogenic load at a predetermined temperature by circulating a wet mixture of a coolant through tubing that is in heat-transfer relationship with the load while maintaining the coolant in a saturated condition throughout the tubing at a constant temperature that is slightly cooler than the predetermined load temperature. The system includes a preconditioning chamber from which liquid coolant is supplied to the tubing. The chamber is partially filled with liquid coolant, with the remainder of the chamber filled with vaporous coolant. Inlet and outlet metering valves for the tubing are mounted in the chamber and controls are provided for maintaining the entire interior environment of the chamber including the valves, interconnecting tubing and both the liquid and vaporous coolant in a state of thermodynamic equilibrium at a temperature that is a few tenths of a degree lower than the predetermined temperature of the load. Sensors are provided at the load and in the tubing for actuating controllers that manipulate the valves to regulate the coolant flow to be at a rate that maintains the coolant in its saturated wet-mixture condition in all sections of the tubing during heat transfer from the load to the coolant.

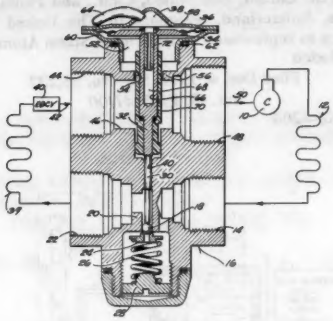
3,667,247
REFRIGERATION SYSTEM WITH EVAPORATOR OUTLET CONTROL VALVE

Robert H. Proctor, Richmond, Ind., assignor to Controls Company of America, Melrose Park, Ill.

Filed July 10, 1970, Ser. No. 53,861
Int. Cl. F25b 41/04
U.S. Cl. 62—217 8 Claims

Refrigerant flows from the compressor and condenser to the evaporator by a thermostatic expansion valve having its pressure and temperature sensing points in the suction line downstream of the evaporator outlet control valve which regulates the evaporator pressure relatively independently of the suction line conditions. When the compressor capacity significantly exceeds evaporator capacity this system provides additional compressor cooling at low suction pressures.

The expansion valve may be the bulbless type or the externally equalized type. The outlet control valve may respond to refrigerant temperature at the coil outlet, or to fin temperature, or may be an evaporator pressure regulator valve.

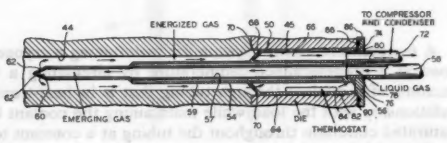


3,667,248

PROBE TYPE DIE COOLING ARRANGEMENT

Arthur H. Carlson, Route 1, P.O. Box 369, Sawyer, Mich.

Filed Sept. 8, 1970, Ser. No. 70,093
Int. Cl. B22d *27/04*; F25b *41/04*
U.S. Cl. 62—225 **3 Claims**



A cooling arrangement for cooling, with liquid carbon dioxide or the like, a die formed with a coolant receiving passage in which a probe structure is mounted in the passage in sealed relation thereto adjacent the outer end of the passage, with the probe comprising an elongate tubular member formed at one end to receive the coolant fluid and at the other end to discharge the fluid into the die passage, and an annular heated coolant receiving chamber formed about the tubular member adjacent its outer end and formed with a heated coolant discharge port adjacent the outer end of the passage and a heated coolant receiving port adjacent the other end thereof and short of the inner end of the tubular member. The coolant receiving end of the tubular member and the coolant discharge end of the chamber are connected into a closed circuit refrigeration system for supplying liquified gas to the probe and reliquifying the heated gas after it leaves the probe for resupply to the probe.

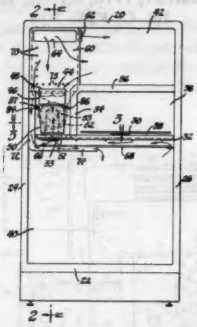
3,667,249

REFRIGERATOR WITH ICE MAKER AND HIGH HUMIDITY COMPARTMENT

Richard C. Brown, and Orson V. Saunders, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 23, 1970, Ser. No. 74,750
Int. Cl. F25c *5/18*
U.S. Cl. 62—312 **5 Claims**

A refrigerator has a high humidity compartment the bottom of which is formed by a pan carrying a film of ice water supplied by the melting of ice cubes in the storage bin of an ice maker. The storage bin has a perforated bottom which drains onto the pan. Refrigerated air in large quantities is used to maintain a below freezing temperature in the freezing compartment and in smaller quantities to maintain the low humidity compartment at above freezing temperatures. The high humidity compartment is cooled through its walls to keep its temperature slightly above freezing.

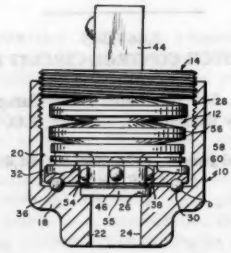


3,667,250

TORQUE RELEASE ADAPTER FOR POWER-OPERATED TOOLS

Lawrence S. Schnepel, 250 Goodman Hill Road, Sudbury, Mass.

Filed Sept. 14, 1970, Ser. No. 71,805
Int. Cl. F16d *7/06*
U.S. Cl. 64—29 **7 Claims**



A torque release adapter comprising coaxially aligned shafts, opposed discs at the adjacent ends of the shafts having spaced parallel surfaces containing circumferentially spaced holes for receiving balls, an internally threaded receptacle integral with one shaft, said receptacle being concentric with the one shaft and an externally threaded cup nut nonrotatably mounted on the other shaft so as to be movable axially on said other shaft, said cap nut being threaded into the receptacle and, in conjunction therewith, providing a closed chamber of variable axial length and a plurality of opposed dished spring washers mounted on said other shaft in the chamber between the cap nut and the disc on said other shaft, said cap nut and receptacle being adapted by rotation of the shafts relative to each other to change the compression of the washers and hence the torque release limit.

3,667,251

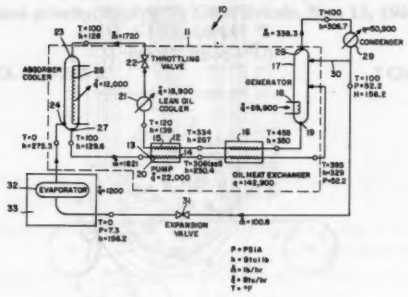
ABSORPTION REFRIGERATION SYSTEM

Gabor Miskolczy, Carlisle, and Robert Kaiser, Cambridge, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Nov. 9, 1970, Ser. No. 87,986
Int. Cl. F25b *15/00*
U.S. Cl. 62—476 **9 Claims**

The invention is directed to an absorption-type refrigeration system in which a magneto-caloric pump system is used

in combination with a compatible-ferrofluid refrigerant

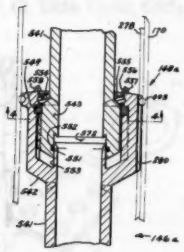


system to replace the percolator-type pump or other conventional pumps.

3,667,252
COUPLING FOR DRILL STRING

Arthur John Nelson, 3304 Shasta Drive, San Mateo, Calif.

Filed Nov. 2, 1970, Ser. No. 85,904
Int. Cl. F16d *3/06*
U.S. Cl. 64—23.5 **3 Claims**



This dual engaging coupling connects equal segmental lengths of tubing in repeating sequence to form an integrated drill string that is suspended by a thrust bearing means from an immersed buoyant pontoon controlled to regulate the bearing pressure of the lower terminally connected bit upon the bottom of a hole being drilled in subaqueous strata. The primary engagement transmits torque, tension and fluid flow between adjacent ends of the two rigid members. The secondary engagement provides uninterrupted translation of the string through the torque imparting means and power transmission by said repeating sequence whereby a subsequent coupling becomes engaged prior to disengagement of a descending coupling departing from the torquing means. The coupling is adapted to rapid assembly and non-selective of mating ends to preserve axial alignment of the secondary engagement.

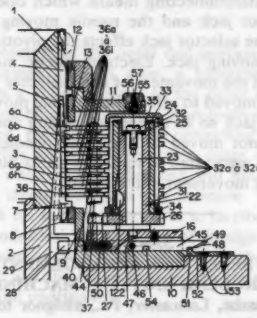
ERRATUM

For Class 64—29 see:
Patent No. 3,667,250

3,667,253
NEEDLE SELECTOR FOR CIRCULAR KNITTING MACHINES

Norbert Paul Bourgeois, 7, place des Chartreux, Troyes, France

Filed Mar. 9, 1970, Ser. No. 17,656
Claims priority, application France, Mar. 10, 1969, 6906719
Int. Cl. D04b *15/74*
U.S. Cl. 66—50 B **9 Claims**

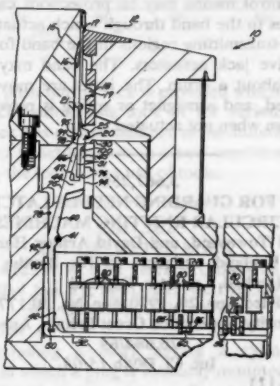


The invention relates to a selector device for needles or needle accessories of a circular knitting machine adapted to select the needles or accessories by means of a removable rotary pattern drum whose periphery may be equipped with removable projecting elements arranged according to a predetermined knitting pattern and adapted to operate on the needles or accessories through an assembly of linking elements arranged in a stepped pattern.

3,667,254
HORIZONTAL SELECTOR JACKS AND THEIR ACTUATION

Horst Paepke, Rottenburg am Neckar, Germany, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Apr. 6, 1970, Ser. No. 25,961
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R **10 Claims**



A circular knitting machine comprises a rotatable knitting needle cylinder which carries a plurality of knitting needles

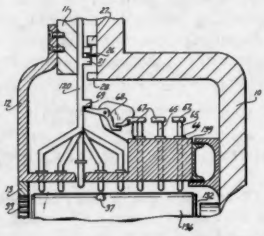
through knitting stations. A needle-moving jack is pivotally connected with each of the knitting needles and is movable in a needle-raising stroke and a needle-lowering stroke to effect needle raising and lowering, respectively, Each of the needle-moving jacks has a butt thereon which is received in a cam track which operates to effect the raising and lowering of the needle-moving jacks. A mechanism is provided for controlling the operation of each knitting needle as it progresses through the stations. The mechanism specifically effects pivoting of the needle-moving jack so that the butt thereon is removed from the cam track to thereby prevent raising and lowering of the needle. The means which effects the pivoting movement of each needle-moving jack comprises a selector jack which is linearly movable in a direction substantially transverse to the axis of rotation of the needle cylinder and interconnecting means which operatively connect the selector jack and the needle moving jack so that movement of the selector jack effects the pivoting movement of the needle-moving jack. Electromagnetic means are provided to control the movement of each selector jack so that a selector jack is moved to effect the pivoting movement of the needle-moving jack so as to prevent raising and lowering of the needle or not moved to allow the needle-moving jack with which it is associated to remain with its butt in the cam track and effect movement of the needle.

3,667,255

NEEDLE SELECTION ARRANGEMENT FOR A CIRCULAR KNITTING MACHINE

Rudolph G. Bassist, Lancaster, Pa., assignor to Travis Mills Corp., a part interest

Filed Dec. 29, 1969, Ser. No. 888,697
Int. Cl. D04b *15/68, 15/74, 15/78*
U.S. Cl. 66—50 R **2 Claims**



A flexible band carries jack actuation control means for determining when the machine jacks are moved so that their butts engage the lower cam race and cause lifting of the needles. The control means may be projections carried by the band, or holes in the band through which actuators can project, or light-transmitting regions in the band for controlling light-responsive jack actuators. The band may be endless, and trained about a drum. The jacks are moved vertically when actuated, and a magnet or spring is provided to hold the jacks down when not actuated.

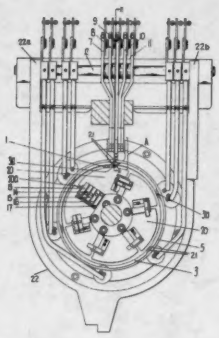
3,667,256

MEANS FOR GUARDING NEEDLE LATCHES OF CIRCULAR KNITTING MACHINES

Keith Gerald Townsend, and David Arthur Harlow, both of Leicester, England, assignors to The Bentley Engineering Company Limited, Leicester, England

Filed Apr. 20, 1970, Ser. No. 30,177
Claims priority, application Great Britain, Apr. 23, 1969, 20,684/69
Int. Cl. D04b *15/08*
U.S. Cl. 66—111 **6 Claims**

In a circular knitting machine there is provided a latch guard devoid of feeder receiving slots but formed instead at a knitting station or each of a plurality of knitting stations with a slot just wide enough to receive a yarn and permit two yarns to pass during a yarn change. Thereby the risk of the



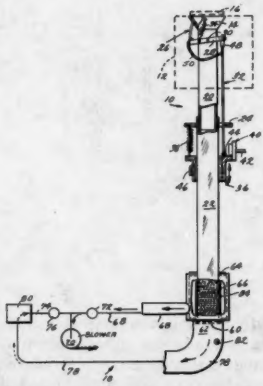
latches of latch needles becoming damaged by swinging into latch guard slots during operation of the machine is avoided.

3,667,257

SLITTING MECHANISM FOR USE WITH CIRCULAR KNITTING MACHINES

Vaughn H. Butler, Harriman, Tenn., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 8, 1970, Ser. No. 1,531
Int. Cl. D04b *35/34*
U.S. Cl. 66—147 **14 Claims**



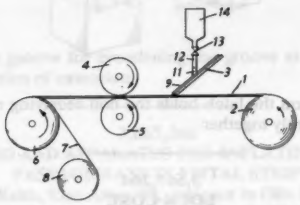
A slitting mechanism for a circular knitting machine is made up of a tubular assembly which can be fitted within the cylinder assembly of such a machine. The slit mechanism includes a heating element for contacting a fabric at a desired point for slitting the fabric, and mechanisms are provided for actuating the heating element in accordance with a controlled sequence of operation which is related to the knitting cycle of the knitting machine. The tubular assembly may optionally include a draw-off system at its lower end.

3,667,258

APPARATUS FOR PRODUCING STRIPED COLORATIONS ON DYEABLE SUBSTRATES IN CONTINUOUS FORM

Clifford Newton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1970, Ser. No. 97,433
Claims priority, application Great Britain, Nov. 13, 1969, 55,608/69
Int. Cl. B05c 5/02
U.S. Cl. 68—205 R 2 Claims



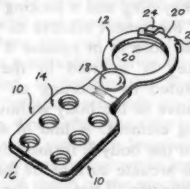
Striped colorations are produced on dyeable substrates incontinuo us or sheet form by applying a plurality of dyestuff streams to the substrate at selected points across its width while the substrate is moved longitudinally relatively to the points of application, and then passing the substrate between nip rollers, the rate of application of the dyestuff streams being so controlled that on passage through the nip the dyestuffs are squeezed into the substrate to form non-overlapping longitudinal stripes of the desired widths.

3,667,259

SAFETY LOCK

Albert K. Reque, Warsaw, Ind., and Julius T. Peterson, Chicago, Ill., assignors to Engineering Development Co., Inc., Warsaw, Ind.

Filed Aug. 5, 1970, Ser. No. 61,246
Int. Cl. E05b 73/00; G05g 5/00
U.S. Cl. 70—14 3 Claims



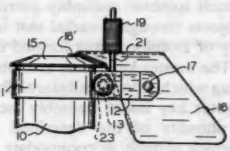
An improved safety lock which includes two pivotally connected members each having a shank portion with an aperture therein and a hook portion. The shank portions of the pivoted members are adapted to overlap with the apertures therein being placed in registry so as to receive the hasp of a padlock. With the shank portions of the members overlapping and the holes therein placed in registry, the free end parts of the hook portions overlap to define, in association with the remainder of the hook portions, a continuous lock ring which is adapted to extend through an anchoring aperture and around a lever or handle of a switch or valve in order to prevent the actuation of the switch or valve. The overlapping end parts of the lock's hook portions include components which cause the end parts to interlock so as to prevent the hook portions from being separated and disengaged from the switch or valve without the release of the padlock which extends through the shank portions of the safety lock and which normally prevents separating movement of the hook portions.

3,667,260

EXHAUST PIPE PROTECTOR LOCK

Daniel J. Foote, Milwaukee, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Jan. 25, 1971, Ser. No. 109,201
Int. Cl. E05b 65/12; B60r 25/04
U.S. Cl. 70—159 10 Claims



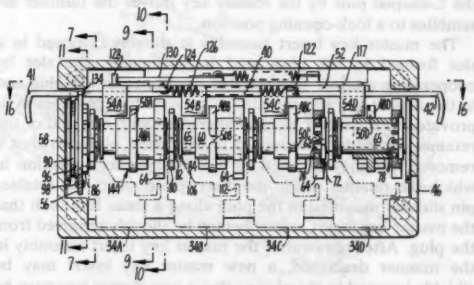
For the protection of the outer end portion of an internal combustion engine exhaust pipe, a protector is available which includes a collar secured to the outer end portion of the exhaust pipe hingedly carrying a protective cover formed with a weighted, radially outwardly projecting fin. The cover normally overlies and closes the open outer end of the exhaust pipe to which it is applied but will hingedly move to open position through exhaust gas pressure. This invention provides a lock for securing the cover in its closed position to prevent the undesired introduction of foreign material into the discharge end of the exhaust pipe when the engine is not being operated and the equipment or vehicle embodying the engine is idle and unattended.

3,667,261

PUSH BUTTON DOOR LOCK

Thomas K. McGourty, Aptos, Calif., assignor to Time Research Development Corporation

Filed Jan. 8, 1971, Ser. No. 104,871
Int. Cl. E05b 37/16
U.S. Cl. 70—301 5 Claims



A compact push button lock is provided which can be used as a door lock, automobile lock or for various other purposes. The lock has a large number of permutations and permits the owner to set the lock to a new combination without disassembling the lock or the use of tools.

3,667,262

KEY OPERATED LOCK

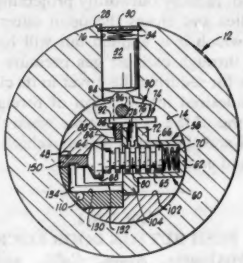
Lewis J. Hill, 4121 N.W. 61st Terrace, Oklahoma City, Okla.

Filed Jan. 11, 1971, Ser. No. 105,359
Int. Cl. E05b 27/02, 35/10
U.S. Cl. 70—384 14 Claims

A lock including a body having a cylindrical bore therethrough in which a plug is rotatably mounted. Apertures in the body slidably receive drivers. The drivers are aligned, in one position of the lock, with tumbler assemblies movably mounted in the plug. The tumbler assemblies extend into a

key slot in the plug, and insertion of a key in this slot biases the several tumbler assemblies to a lock-opening position in which the tumbler assemblies contact the drivers along a shear line lying in the interface between the plug and the body. The tumbler assemblies are adjustable in their dimensions by the use of a change key so that they may be altered to permit a new key to be made operative for opening the lock.

One part of each tumbler assembly carries a projecting flange which projects through a radial slot in the plug into one of a plurality of L-shaped slots formed in a master key insert assembly. The master key insert assembly is positioned in a slot in the plug which extends substantially parallel to the key slot. The master key insert assembly includes an insert plate having a plurality of the described L-shaped slots formed therein which slidably accommodate L-shaped pins. One leg of each L-shaped pin projects into the key slot in a position for cooperation with the milled surface of a master key, so that when a master key correlated to the particular master key insert assembly in use is placed in the key slot,



the L-shaped pins are biased by the milled surface of the master key to a lock-opening position. The second end of each of the L-shaped pins bears against the flange carried by one portion of each tumbler assembly so that displacement of the L-shaped pins by the master key moves the tumbler assemblies to a lock-opening position.

The master key insert assembly is slidably disposed in a slot formed in the plug, and is retained in the slot by cooperating retainer pins slidably positioned in the plug and in the master key insert plate. A removal tool passageway is provided in the insert plate in alignment with one end of the retainer pin slidably mounted in the insert plate, so that a removal tool may be used to bias this pin to a position in which the retainer pin in the insert plate meets the retainer pin slidably mounted in the plug along a shear line such that the master key insert assembly may be slidably removed from the plug. After removal of the master key insert assembly in the manner described, a new master key insert may be slidably inserted in the plug so that a new master key must be utilized to open the lock.

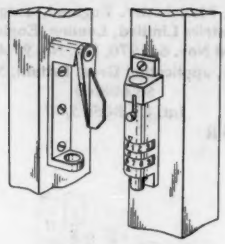
3,667,263

COMBINATION LOCK WINDOW LATCH

Edward Parry Rogers, The Briars, 81 Shelone Road, Briton Ferry, Neath, Wales

Filed June 25, 1970, Ser. No. 49,891
Claims priority, application Great Britain, June 26, 1969, 32,400/69
Int. Cl. E05b *37/02, 59/00, 65/06*
U.S. Cl. 70—89 **2 Claims**

The invention relates to a window latch with a lockable bolt axially slideably mounted in a housing. The locking means for the bolt is a keyless combination lock incorporating rotatable slotted annular locking collars located in the bolt housing and disposed coaxially around the bolt. The bolt in the locked position is received in bolt receiving means, there being a pivotable latch on the bolt receiving means which has a surface having a co-operative relation with a tapered surface on the housing so that when the bolt is in the



locked position the latch holds the bolt receiving means and housing securely together.

3,667,264

LOCK CORE

Walter E. Surko, Jr., Southington, and James W. Elliott, West Hartford, both of Conn., assignors to Emhart Corporation, Bloomfield, Conn.

Filed Feb. 10, 1970, Ser. No. 10,190
Int. Cl. E05b *27/00*
U.S. Cl. 70—369 **14 Claims**

A removable or interchangeable figure-8 pin tumbler lock core adapted to be received and locked in a housing and for operating an associated lock mechanism. The core has a body supporting a key plug and a locking element arranged for limited angular movement relative to the body and the key plug to lock the core in or release it from the housing when a control key is inserted in the plug. The lock mechanism is operated by inserting an operating key to rotate the plug relative to the body without effecting movement of the locking element. A line of shear between the locking element and the body is formed by a planar surface of the body and an arcuate surface of the locking element generally tangent thereto. Lugs on the locking element cooperate with grooves in the body to prevent escape of pin tumblers from the locking element or the body when the locking element is rotated between its locking and releasing positions.

3,667,265

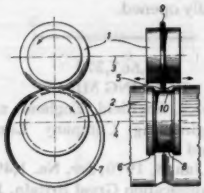
METHOD FOR THE FABRICATION OF STIFFENING CORRUGATIONS IN THIN-WALLED, HARD SHEETS, ESPECIALLY OF CIRCUMFERENTIAL CREASE

Gernot Zippe, Julich, Germany, assignor to Gesellschaft fur Kernverfahrenstechnik mbH, Julich, Germany

Filed Mar. 3, 1970, Ser. No. 16,229
Claims priority, application Austria, Mar. 3, 1969, A 2073/69
Int. Cl. B21d *17/04*
U.S. Cl. 72—84 **3 Claims**

Method of production of beads in thin-walled hard sheet, especially of circumferential creases in rotors of centrifuges, by means of a roller and a counter roller as the pressing tools which accomodate between them the material to be worked; the method includes pressing a roof-shaped groove into the

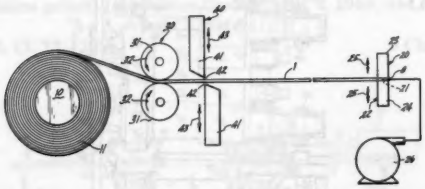
hard material within its limits of plastic deformation and then superimposing on the roller an oscillatory motion at right angles to the groove for broadening the groove at right angles to its direction of extension.



3,667,266
METHOD AND APPARATUS FOR INFLATING FLUID PASSAGEWAYS IN METAL STRIP

Norval A. Keith, East Alton, Ill., assignor to Olin Corporation

Filed May 13, 1970, Ser. No. 36,783
Int. Cl. B21d *53/02*
U.S. Cl. 72—55 **8 Claims**



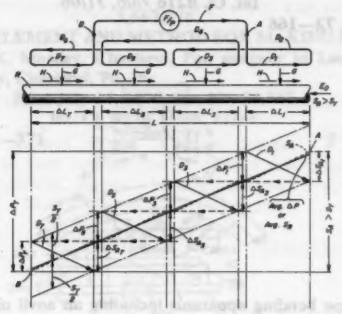
A method and apparatus for inflating lengths of metal strip having at least one inflatable fluid passageway, and preferably, long lengths of such strip. The process employs a coil of the metal strip. The metal strip preferably is of a composite metal, wherein the inflatable fluid passageways correspond to patterns of weld inhibiting material. The strip is paid off from the coil and pinched to prevent subsequent inflation from reaching the coil itself. The other end of the strip is clamped in a suitable inflation device through which pressure is applied to inflate the fluid passageway or passageways. The inflation proceeds up to the pinched off portion of the strip. Thereafter, the strip is severed just ahead of the pinching means, yielding a long length of strip having at least one inflated passageway while leaving an open tube in the end of the coil ahead of the pinching means for insertion in the inflation fixture for inflation of a subsequent length of strip. The apparatus comprises means for holding a coil of the strip, pinching means receiving the strip from the coil, inflation means receiving the strip from the pinching means and severing means spaced between the pinching means and the inflation means for severing the strip from the coil after it has been inflated.

3,667,267
APPARATUS AND METHOD FOR CONTINUOUS MATERIAL FEEDING AND DEFORMATION

Francis J. Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 794,488, Jan. 28, 1969. This application Nov. 14, 1969, Ser. No. 876,940
Int. Cl. B21c *33/00, 1/20*
U.S. Cl. 72—60 **75 Claims**

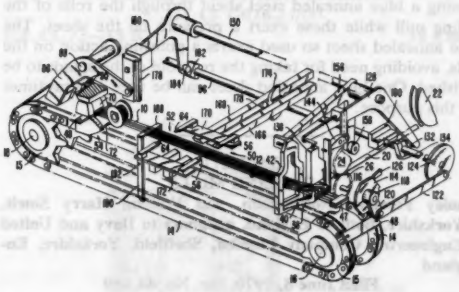
Disclosed herein is a process in which flowing fluids are utilized to apply viscous drag forces to a rod of indefinite length and advance it continuously through an extrusion die, to produce a continuous product, for example, a wire. The flowing fluids also control the axial and radial stresses in the rod, sealing it into and out of a treating environment so that undesirable rod pinch-off, bulging, or tension failure is avoided. The temperature, and hence viscosity, of the flowing fluids may be adjusted to control viscous drag forces.



3,667,268
METHOD OF AND APPARATUS FOR CORRUGATING PLIABLE MATERIAL

Jakob Rech, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 17, 1969, Ser. No. 867,134
Int. Cl. B21d *13/00*
U.S. Cl. 72—133 **25 Claims**



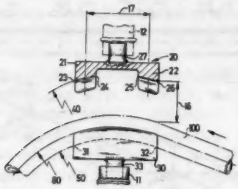
Forming corrugations in pliable material, such as metallic sheet stock, including the steps of imparting an initial relatively widely spaced apart corrugations in a workpiece composed of this material, following which the workpiece is introduced between two sets of flexible rods or wires which are arranged to seat in the loops of the corrugations on opposite sides of the workpiece. Thereafter, each such workpiece is transported by sliding motion along the wires and at one or more stations therealong the workpiece is subjected to endwise compression causing contouring of the loops of the corrugations around the wires as mandrels to form a relatively densely corrugated article. The wires are capable of lateral displacement with respect to one another with the result that during endwise compression of the workpiece they will move closer together to accommodate the contraction of the workpiece and the reduced spacing of the convolutions.

3,667,269

APPARATUS FOR THE COLD-BENDING OF PIPES

Siegfried Bergner, Munich, Germany, assignor to Paweck AG, Chur, Switzerland

Filed Aug. 27, 1969, Ser. No. 853,243
Int. Cl. B21d *7/06, 31/06*
U.S. Cl. 72—166 **8 Claims**



A pipe bending apparatus including an anvil of a desired radius and a hammer ram having spaced hammer elements spaced from one another to have a bending radius larger than the radius of the anvil. The pipe is adapted to be incrementally fed through the apparatus between hammering actions.

3,667,270

METHOD FOR SMOOTHING ROLLS FOR COLD ROLLING OR FINISHING COLD ROLLING OF BRIGHT METAL SHEET OR THE LIKE

Willem Hendrik Deurloo, Ijmuiden, Netherlands, assignor to Kaninkijke Nederlandsche Hoogovens en Stall Fabrieken N.V., Ijmuiden, Netherlands

Filed Apr. 24, 1969, Ser. No. 819,528
Claims priority, application Netherlands, May 1, 1968, 6806154
Int. Cl. B21b *27/00*
U.S. Cl. 72—236 **3 Claims**

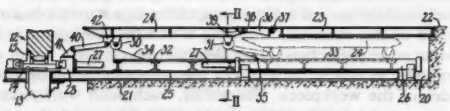
A considerable reduction of the polishing of rolls of a rolling mill for cold-rolling metals is obtained by periodically passing a blue annealed steel sheet through the rolls of the rolling mill while these exert a pressure on the sheet. The blue annealed sheet so used exerts a polishing action on the rolls, avoiding need for taking the rolls out of the stands to be polished. One blue annealed sheet can be used several times for this purpose.

3,667,271

ROLLING MILLS

Stanley Fereday, Nottingham, and William Harry Smelt, Yorkshire, both of England, assignors to Davy and United Engineering Company Limited, Sheffield, Yorkshire, England

Filed June 8, 1970, Ser. No. 44,489
Int. Cl. B21b *31/08*
U.S. Cl. 72—238 **4 Claims**



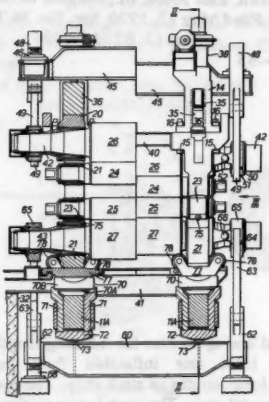
A cover for a pit comprises two parts which when arranged in side-by-side relation are together of sufficient size and shape to cover the mouth of the pit. One part of the cover is secureable in the mouth of the pit and the second part is supported on inclined surfaces so that the second part can be displaced from the position where it is side-by-side with the first part with their upper surfaces coplanar to a position in which it is beneath the first part. The cover is particularly suitable for covering a pit adjacent a rolling mill. The movable part of the cover may be connected to a sledge in the mill and carrying the rolls so that on withdrawing the rolls the cover is automatically opened.

3,667,272

ROLLING MILLS

Jack Maltby, Todwick, Sheffield, England, assignor to Davy and United Engineering Company Limited, Sheffield, Yorkshire, England

Filed Jan. 8, 1970, Ser. No. 1,496
Claims priority, application Great Britain, Jan. 13, 1969, 1,827/69
Int. Cl. B21b *31/32*
U.S. Cl. 72—245 **11 Claims**



A rolling mill stand is constituted by two pairs of housing posts, the rolls extending between the pairs of posts, and the posts of each pair defining between them a window for the roll chocks. For each pair of posts, there is a strap bridging the posts and interposed between the chocks and roll gap adjusting means. A beam is carried by the two straps and extends parallel to the roll axes to bridge the pairs of posts. This beam extends, at each end, beyond the housing posts and carries means for bending one of the rolls of the mill.

3,667,273

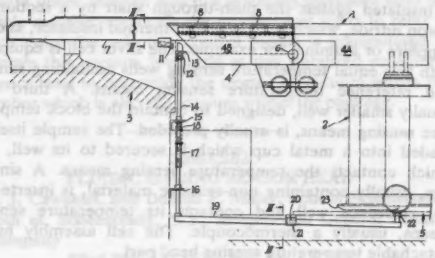
RUN-OUT TROUGHS FOR EXTRUSION PRESSES

Oswald Kennedy, and John Ian Harrison, both of Newcastle upon Tyne, England, assignors to Vickers Limited, London, England

Filed Dec. 23, 1969, Ser. No. 887,641
Claims priority, application Great Britain, Dec. 23, 1968, 61,162/68
Int. Cl. B21c *35/00*; **B21d** *45/00*
U.S. Cl. 72—257 **5 Claims**

A run-out trough for an extrustion press, the trough having an extendable portion that can be moved from a retracted position to an extended position in which it effectively lengthens the extruded material supporting surface of the trough, the run-out trough being adapted for co-operation with an extrusion press such that upon movement of the run-out trough, with the extendable portion initially in its

retracted position, to carry an extrusion away from the press, the extendable portion moves to its extended position



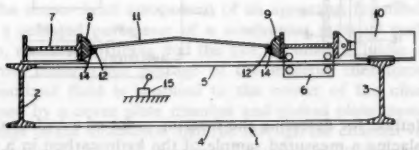
thereby to support that end portion of the extrusion that is the last part of the extrusion to be extruded.

3,667,274

APPARATUS FOR BENDING PLATE

Richard Allan Gordon Cape, Lachine, Quebec, Canada, assignor to Dominion Bridge Company Limited, Montreal, Quebec, Canada

Filed Apr. 3, 1969, Ser. No. 813,092
Claims priority, application Canada, Mar. 4, 1969, 044,626
Int. Cl. B21d *11/20*
U.S. Cl. 72—298 **5 Claims**



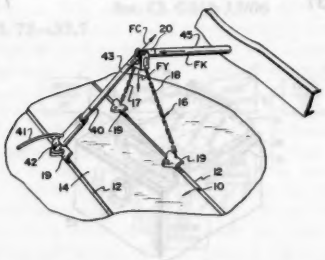
The method of forming trough members for use in the fabrication of orthotropic deck bridges which involves applying opposing forces to the edges of a flat plate to move the edges towards each other.

3,667,275

SELF-STABILIZING FORCE DISTRIBUTING APPARATUS

Wayne E. Hunnicutt, Big Bend, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Feb. 25, 1970, Ser. No. 13,928
Int. Cl. B21d *1/12*
U.S. Cl. 72—302 **10 Claims**



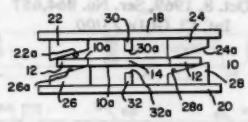
A freely positionable force transfer device for applying forces at selected directions and magnitudes to reform and straighten structures. The device is operative to receive a force producing power strut and reactive force members to direct the forces of each through a common axis to minimize internal moments and ensure stable operation in a plurality of geometrical arrangements within the operational range of the device.

3,667,276

SPIRAL ELEMENT AND METHOD FOR MAKING SAME

Roderick K. Moodey, Charleroi, Pa., assignor to Lee-Norse Company, Charleroi, Pa.

Filed July 14, 1970, Ser. No. 54,747
Int. Cl. B21d *11/06, 11/14*
U.S. Cl. 72—371 **9 Claims**



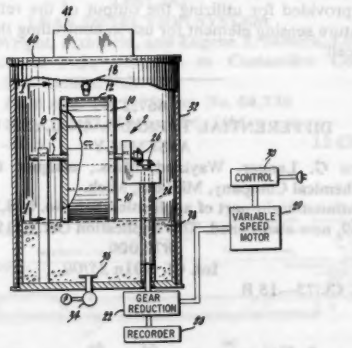
A spiral element formed by a method which may comprise the steps of providing a generally arcuate blank of arcuate length not greater than about 180°, applying force to the ends of the blank to laterally twist such ends simultaneously in opposite directions, and during said twisting restraining the arcuate center of the blank from lateral twisting and maintaining the arcuate lengths of the blank between its arcuate center and its ends unsupported whereby the twisting forms the blank to spiral configuration.

3,667,277

APPARATUS FOR MEASUREMENT OF TEXTILE FLAMMABILITY PROPERTIES

Bernard Miller, Princeton; Harold Lambert, Pennington, both of N.J., and Charles H. Meiser, Jr., Yardley, Pa., assignors to Textile Research Institute, Princeton, N.J.

Filed Jan. 13, 1971, Ser. No. 106,115
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 R **18 Claims**



A method and equipment for use in determining the rate of flame propagation and other burning characteristics of sheet materials wherein a test strip of material is supported adjacent its opposite edges and after being ignited is advanced toward the burning zone at a rate sufficient to maintain said zone in a predetermined location. The speed at which the strip of material is moved toward the burning zone is observed and recorded whereby the rate of flame propagation in the material under the test conditions can be determined.

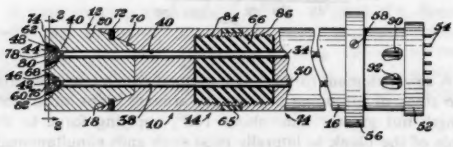
The equipment may be housed within an enclosure and the composition, pressure, humidity and other conditions of the atmosphere in which the burning of the material takes place can be varied and controlled so as to obtain consistent and accurate determinations as to the flammability and burning characteristics of the material under any predetermined conditions.

3,667,278

DIFFERENTIAL THERMAL ANALYSIS CELL ASSEMBLY

Horst G. Langer, Wayland, Mass.; Franklin J. Karle, Midland, and Earl D. Ayers, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 8, 1969, Ser. No. 864,657
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 B **10 Claims**



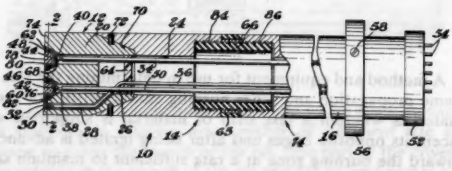
This invention relates to a thermal analysis cell which is capable of supplying meaningful data in a high vacuum and which is particularly useful for operations within a mass spectrometer or similar instrument which allows the heating of samples within the confinement of the mass spectrometer vacuum or adjacent to the ion source. The cell comprises a silver block to guarantee uniform heat throughout the cell. It is insulated against the push-through shaft by a section of boron nitride, which is an excellent thermal insulator, and by sapphire or alumina, for example. The silver cell is equipped with two equal temperature sensing wells containing sample and reference temperature sensing means. The sample itself is loaded into a metal cup which is usually secured to its well, and which contacts the temperature sensing means. A similar cup, usually containing non-reactive material, is inserted in the reference well and contacts its temperature sensing means, usually thermocouple. The cell assembly has a detachable temperature sensing head part. External means are provided for utilizing the output of the reference temperature sensing element for use in controlling the heating of the cell.

3,667,279

DIFFERENTIAL THERMAL ANALYSIS CELL ASSEMBLY

Horst G. Langer, Wayland, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 848,231, Aug. 7, 1969, now abandoned. This application Oct. 8, 1969, Ser. No. 870,000
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 B **11 Claims**



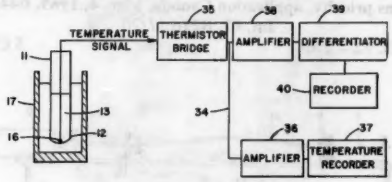
This invention relates to a thermal analysis cell which is capable of supplying meaningful data in a high vacuum and which is particularly useful for operations within a mass spectrometer or similar instrument which allows the heating of samples within the confinement of the mass spectrometer vacuum or adjacent to the ion source. The cell comprises a silver block to guarantee uniform heat throughout the cell. It is insulated against the push-through shaft by a section of boron nitride, which is an excellent thermal insulator, and by sapphire or alumina, for example. The silver cell is equipped with two equal temperature sensing wells containing sample and reference temperature sensing means. A third and usually smaller well, designed to contain the block temperature sensing means, is usually provided. The sample itself is loaded into a metal cup which is secured to its well, and which contacts the temperature sensing means. A similar cup, usually containing non-reactive material, is inserted in the reference well and contacts its temperature sensing means, usually a thermocouple. The cell assembly has a detachable temperature sensing head part.

3,667,280

METHOD FOR DETERMINING THE FREEZING POINT OF A HYDROCARBON

Samuel W. Simpson, Florissant, Mo., assignor to Shell Oil Company, New York, N.Y.

Filed July 15, 1970, Ser. No. 54,976
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 R **4 Claims**



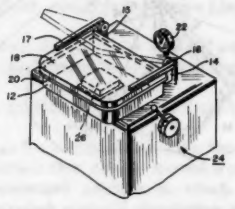
Method for detecting the freezing point of a hydrocarbon by placing a measured sample of the hydrocarbon in a container and placing a thermistor in the container into contact with the sample. The container is cooled until its temperature curve shows a noticeable plateau which is detected by the slope of the temperature curve which is being tracked by a first derivative circuit. The container is then insulated thus warming the sample and, as the last crystals in the sample melt, the slope of the curve momentarily accelerates causing the circuit to produce a voltage peak which is the freezing point of the sample.

3,667,281

VACUUM TESTER FOR PACKAGES WITH FLEXIBLE COVERS

Charles F. Pfeifer, 39 Parade Hill Lane, New Canaan, Conn.

Filed Nov. 4, 1970, Ser. No. 86,706
Int. Cl. G01m *3/12, 3/26*
U.S. Cl. 73—37 **7 Claims**



A vacuum tester for the non-destructive testing of vacuum packages, particularly those provided in the packaging of meat and heat-and-serve products wherein one of the

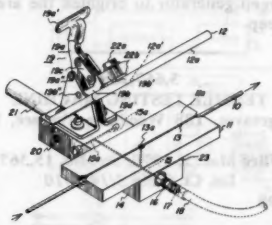
packaging members is a flexible member such as film. This tester includes a viewing chamber having a selective control means disposed to bring the chamber to a reduced pressure such as 28 or 30 inches of mercury. The closed chamber is brought under vacuum which is gradually increased until the flexible member enclosing the product just starts to relax at which point the selective control means is manipulated to maintain this vacuum level and at this stabilized pressure a gauge is read to determine the degree of vacuum within the chamber which is also the vacuum within the package.

3,667,282

FLUIDIC GAGING SENSOR HEAD

Bert J. Czwakiel, and Donald F. Miller, both of Schenectady, both of, Schenectady, N.Y., assignors to General Electric Company

Filed Feb. 18, 1970, Ser. No. 12,289
Int. Cl. G01b *13/08*
U.S. Cl. 73—37.7 **5 Claims**



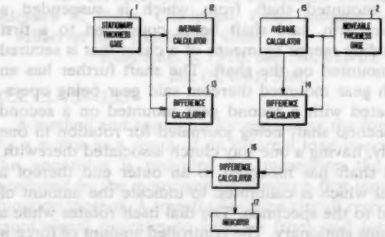
The sensor head component of an apparatus for monitoring a selected parameter of a continuous material such as yarn, metal rod, tubing and the like, includes a fluidic long, narrow channel for passage of the material therethrough. Pressurized fluid is supplied to the center of the channel formed by a cover plate member and slotted plate member. Passage of the monitored material through the channel varies the restriction thereof in proportion to the magnitude of the monitored parameter and develops a variable back pressure linearly proportional thereto. A toggle clamp provides alternate engagement with and separation of the plate members. A spring device connected to the cover plate member provides a means for loading and threading a yarn material in the sensor head without stopping the longitudinal motion of the yarn.

3,667,283

MEANS FOR MEASURING THICKNESS OF SHEET MATERIAL

Haruo Takenaka, Tokyo; Hiroshi Okuyama, Kanagawa; Noburo Hibino, Kanagawa, and Eiichi Ohta, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 1, 1970, Ser. No. 33,806
Int. Cl. G01b *13/06*
U.S. Cl. 73—37.7 **6 Claims**



A stationary thickness gauge is combined with a movable thickness gauge to measure the true thickness in the lateral direction of a running web or sheet material. The movable thickness gauge is moved in a direction transverse to the running direction of the web or sheet.

3,667,284

TAPERED BORE PROBE

Ronald D. Amland, Los Angeles, and Robert L. Castle, El Segundo, both of Calif., assignors to Gar Honing Service, Inc., El Segundo, Calif.

Filed Apr. 27, 1970, Ser. No. 32,300
Int. Cl. G01b *13/18*
U.S. Cl. 73—37.9 **13 Claims**

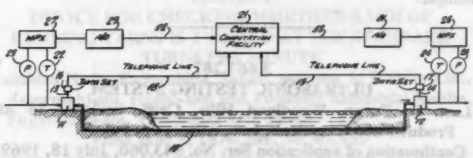
An instrument for verifying the taper angle of a tapered bore comprising a handle portion to which a tapered probe is fixed. The tapered probe is formed so as to have a proper diametral relationship throughout its length with the tapered bore to be verified and has a plurality of radial jets therein, each corresponding to a different bore position. Coaxial passages are formed in the handle portion and the probe and a connecting rod is movable by an operator in an axial direction therein. Air is passed through an axial bore in the connecting rod for delivery to a piston at the opposite end thereof through which it is radially expelled through one of the probe radial jets. The connecting rod may be moved to predetermined positions, each corresponding to one radial jet, so that the piston may be properly aligned therewith. As the air passes through the probe radial jets, it is directed against the surface of the bore, creating a back pressure in the air system. Proper diametral sizing of the respective jets will cause equal back pressure readings to be generated when air is selectively passed through each of the radial jets, if the bore is properly tapered. If the bore is not properly tapered, the back pressure readings will vary between different radial passages.

3,667,285

LEAK DETECTION SYSTEM

Edward L. Wright, Plainfield, and Eugene T. Meseck, Lincoln Park, both of N.J., assignors to Customline Control Products, Inc., Linden, N.J.

Filed Aug. 18, 1970, Ser. No. 64,736
Int. Cl. G01m *3/26, 3/16*
U.S. Cl. 73—40.5 **12 Claims**



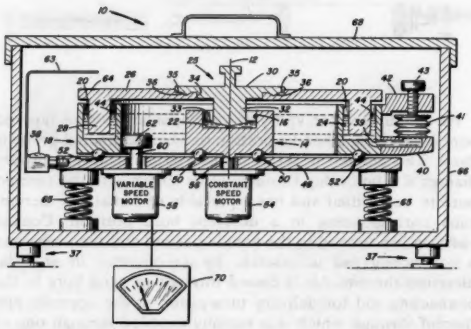
A system is disclosed for detecting relatively small leaks in partially inaccessible pipelines having high throughputs. To detect the leaks information from a flow meter and pressure and temperature transducers at each end of the pipeline are fed over telephone lines to a central computation facility. At the computation center the temperature and pressure information is employed along with information stored in the computer to generate set points for a pair of counters. The computer then gates the outputs from the flow meters into the counters over an interval until both of the counters reach

their set points. The computer than examines the numbers in the two counters to perform logical operations to determine if in fact, the pipeline is leaking. If a confirmed leak is detected a shut down procedure may be instituted.

3,667,286
VISCOMETER

William M. Kaufman, Chevy Chase, and Harry P. Kling, Glenarm, both of Md., assignors to Hittman Associates, Inc., Columbia, Md.

Filed Apr. 21, 1970, Ser. No. 30,566
Int. Cl. G01n *11/10*
U.S. Cl. 73—59 **12 Claims**



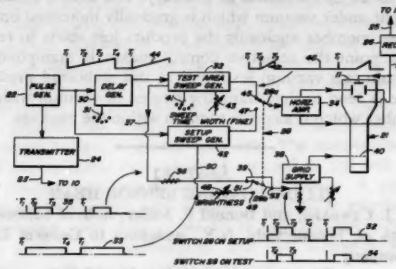
A viscometer, particularly suited for blood viscometry. The inventive viscometer is circularly symmetrical and comprises a cylindrical channel for housing an unknown fluid and a ring-shaped channel, concentric with the cylindrical channel, for housing a known Newtonian fluid. A floatable cover element is provided with a cylindrical projection adapted to associate with the cylindrical channel and the fluid housed therein, and is further provided with a ring-shaped projection adapted to associate with the ring-shaped channel and the Newtonian fluid housed therein. The cover element floats in the known Newtonian fluid with a fluid bearing action, the ring-shaped projection being coated with a material which is non-wettable, and the channel being coated with a material wettable by the known fluid. The block in which is defined the cylindrical channel and the block in which is defined the ring-shaped channel are rotated in opposite directions, and the relative velocity of rotation therebetween is adjusted until the floating cover element is stationary. The relative rotation between the cylindrical channel block and the ring-shaped channel block is proportional to the viscosity of the unknown sample.

3,667,287
ULTRASONIC TESTING SYSTEM

Leon D. Furon, Woodland Hills, Calif., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of application Ser. No. 843,060, July 18, 1969, now abandoned, which is a continuation of application Ser. No. 564,697, July 12, 1966, now abandoned. This application Nov. 30, 1970, Ser. No. 93,530
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.9 **1 Claim**

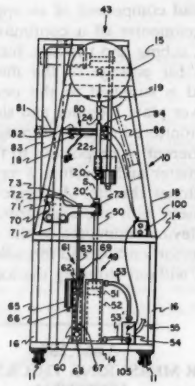
Electronic circuitry is described which provides two continuously available signals which include means for switching a desired one of the two displays on the cathode ray tube. A first sweep generator provides a full display of the signal. A second sweep generator provides an expanded display for showing only a desired test area. A switching circuit is provided to switch between the two sweep generators to display either the entire sweep signal or the test area. The unblanking signal provided to the cathode ray tube from the second sweep generator is superimposed onto the unblanking signal of the first sweep generator to brighten the area of interest during full sweep.



3,667,288
TENSILE TESTING MACHINE

John E. Hargreaves, 188 Woodbine Terrace, Spartanburg, S.C.

Filed Mar. 2, 1970, Ser. No. 15,367
Int. Cl. G01n *3/14, 3/10*
U.S. Cl. 73—98 **13 Claims**



A machine for testing the strength of a filament, yarn, fabric, etc specimen by securing said specimen between two clamps and applying a controlled amount of force to one of said clamps while resisting said force with a pivotably mounted lever arm having a predetermined amount of weight positioned thereon. The machine of the present invention has a rotatably mounted shaft from which is suspended a weighted lever arm, said shaft being connected to a first specimen holding means by means of a chain that is secured to a drum mounted on the shaft. The shaft further has an anti-backlash gear mounted thereon, said gear being operatively associated with a second gear mounted on a second shaft. Said second shaft being journaled for rotation in one direction only, having a one way clutch associated therewith. Said second shaft has mounted to an outer end thereof a rotatable dial which is calibrated to indicate the amount of force applied to the specimen. The dial itself rotates while a pointer remains stationary. The controlled amount of force is applied to a second specimen holding means and is generated by a hydraulic cylinder or a combination hydraulic cylinder

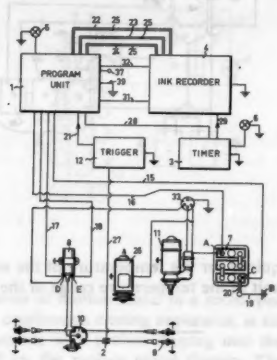
and air cylinder. The weight lever arm has positioned proximate thereto an electromagnet which, before application of the controlled amount of force to the specimen, remains energized to prevent movement of the lever arm during securing of the specimen to the specimen holding means.

3,667,289

APPARATUS FOR TESTING AUTOMOBILES

Anders Yngve Back, Johanneshov, Sweden, assignor to Aktiebolaget Scania-Vabis, Sodertalje, Sweden

Filed Jan. 5, 1970, Ser. No. 1,070
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.3 **13 Claims**



A measuring and recording apparatus for testing of motor cars in accordance with a predetermined test program including a program unit having a plurality of measuring data inputs connected to different measuring points of a motor car, particularly points of the motor and electrical system thereof. Said inputs are successively switched through to the measuring system of a recording instrument, the successive switching actions being timed in synchronism with the rotation of the motor when disabled and rotated by the starter. During one revolution of the motor, the relative compressions of the cylinders are recorded by recording the starter current, during another revolution, the primary current of the ignition system is recorded, and further single or double measurements may be carried out during any subsequent revolution. Then, the successive switching actions are timed in dependence on time so that during a fixed period, for example, the motor is blocked and the starter is energized, the starter current being recorded during this measuring period. In this way, a test operation results in a series of successive records of magnitudes, essential for the performance of the motor car, are obtained.

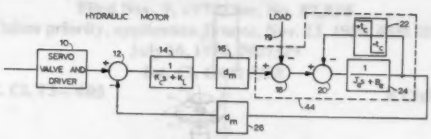
3,667,290

METHOD AND APPARATUS FOR ESTIMATING THE FORCE GENERATED BY A MOTOR AS A FUNCTION OF AN EXTERNAL LOAD IMPOSED THEREON

Richard E. Hohn, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 6, 1970, Ser. No. 61,702
Int. Cl. G01l *3/00*
U.S. Cl. 73—133 **9 Claims**

A method and apparatus for estimating the force produced by a motor as a result of an external load imposed thereon. An apparatus is provided for measuring the total force produced by the motor and producing a first input signal as a function thereof. A transfer function circuit responsive to the input signal operates to subtract from said total force the dynamic and frictional forces in said motor. This result is integrated to produce an estimated motor velocity. A second input signal to the transfer function circuit is provided by an apparatus for measuring the actual velocity of the motor. The actual velocity is compared with the estimated velocity to produce a signal which is input to a feedback loop. The feedback loop provides a feedback signal which simultaneously is algebraically summed with the first input signal and produced by the transfer function circuit as a representation or estimation of an external load imposed on the motor.

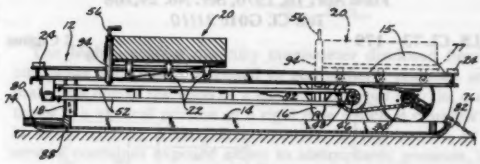


3,667,291

TRACTOR PULL LOAD MEASURING DEVICE

Leonard R. Peak, Lacona, Iowa

Filed Nov. 16, 1970, Ser. No. 89,628
Int. Cl. G01l *5/13*
U.S. Cl. 73—141 R **9 Claims**



A device having an elongated frame supported at its rear end by ground engaging wheels and having a slid below the frame pivotally connected thereto forwardly of the wheels. The skid is adapted to engage the ground along its length during use or be raised above the ground for transport by a tongue being connected to the skid and the frame being pivoted upwardly about an axis through the wheels thereby lifting the rear of the skid. A ballast trolley is moveable from over the wheels on the frame to the front end as the wheels turn thereby increasing the drag due to the load being transferred to the skid engaging the ground. Measuring indicia along the frame is provided to indicate the pulling ability of the vehicle being tested in terms of how far the ballast trolley is moved forwardly.

3,667,292

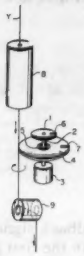
DEVICE FOR CHECKING WHETHER EACH OF RUNNING YARNS IS TWISTED AT THE STANDARD TURNS PER MINUTE

Yukihiro Hada, Fujiyoshida, Japan, assignor to Unitika Ltd., Amarasaki-shi, Hyogo-ken and Fujikelki Kabushiki Kaisha, Fujiyoshida-shi, Yamanashi-ken, Japan

Filed June 1, 1970, Ser. No. 41,959
Claims priority, application Japan, June 3, 1969, 44/43387
Int. Cl. G01l *5/00*; D01h *17/00*
U.S. Cl. 73—160 **6 Claims**

The device of the present invention is used for checking whether each of running yarns is twisted at the standard turns per minute. This device comprises a driving shaft, a motor provided with a variable speed means and a yarn contact means. The driving shaft is rotated at a rotating speed corresponding to the standard turns per minute, at which each of running yarns should be twisted. The yarn contact means is imparted a torque from the shaft and running yarn, which

is brought in contact with it. The shaft and the yarn contact means carry marks which can be viewed with a stroboscope



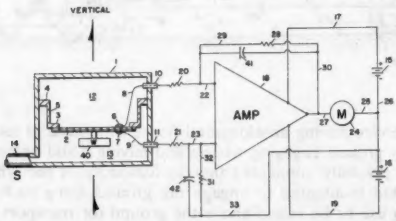
to determine whether the shaft and contact means are rotating at the same speed.

3,667,293

BIMORPH SENSOR FOR ELECTRICALLY MEASURING PRESSURE CHANGES

Alvin G. Moore, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 16, 1970, Ser. No. 29,208
Int. Cl. G01c *21/10*
U.S. Cl. 73—179 **2 Claims**



A bimorph sensor for measuring pressure changes having a circular bimorph and a thin flexure comprising iron-nickel alloy supporting the circular bimorph at its circumference and said flexure having its outer extremity adapted to support said bimorph in a pressure cell comprising iron-nickel alloy, whereby a high electrical output is obtained from the said bimorph in response to pressure being applied thereto.

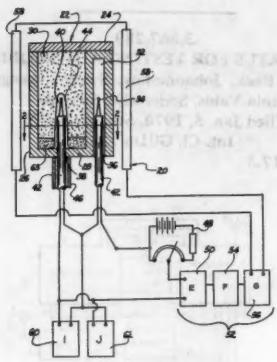
3,667,294

APPARATUS FOR THERMAL ANALYSIS

Robert A. Schoenlaub, Columbus, Ohio, assignor to The Edward Orton, Jr. Ceramic Foundation, Columbus, Ohio

Filed July 23, 1969, Ser. No. 844,031
Int. Cl. G01k *17/00*
U.S. Cl. 73—190 R **6 Claims**

A method and apparatus for high measurement of heat content which includes an electric furnace in which a sample holding container of predetermined dimensions is placed. A pair of differentially connected thermocouples are disposed such that one measures the temperature of the container walls as a reference and the other the temperature of the sample. A source of bias voltage is used to cause the hot junction of the reference thermocouple to be maintained at a given temperature differential above the other thermocouple. A control system is operatively connected to the thermocouples and to the power source of the furnace to vary the amount of heat delivered to the container responsive to maintaining the predetermined temperature differential between the thermocouples as established by the bias voltage. The temperature of the sample is then recorded versis



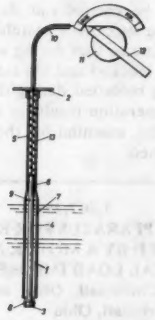
the time required for the temperature of the sample to reach the upper limit of the temperature range of the test run.

3,667,295

OIL GAUGE

Stanislaus Skutella, Rothweg 6 A, 7911 Pfaffenhofen-Roth, Germany

Filed Sept. 2, 1970, Ser. No. 68,932
Claims priority, application Germany, Sept. 6, 1969, P 19 45 241.6
Int. Cl. G01f *23/00*
U.S. Cl. 73—290 R **11 Claims**



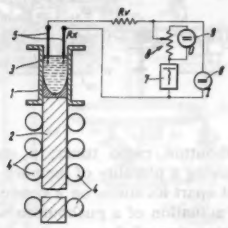
A method of and apparatus for checking the liquid level in a container according to which a tubular member is immersed into said liquid and below its minimum level, whereupon liquid and air is trapped in said tubular member by a piston and a seal about the rod of a piston and the air is compressed by the entrapped liquid, the compression stroke on the entrapped liquid and air furnishing an indication for the liquid level in the respective container.

3,667,296

METHOD AND APPARATUS FOR DETERMINING THE SURFACE LEVEL OF MOLTEN MATERIAL IN A MOLD

Peter Schiefer, Muehlheim (Ruhr), and Bernd Findeisen, Duisburg-Buchholz, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed July 24, 1970, Ser. No. 58,044
Claims priority, application Germany, July 28, 1969, P 19 38 840.0
Int. Cl. B22d 11/10; G01f 23/24
U.S. Cl. 73—304 R 4 Claims



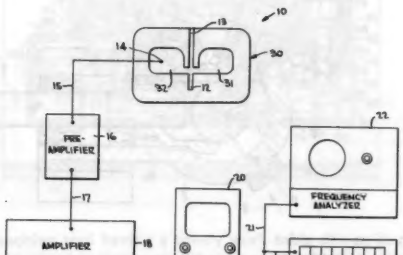
The rising level of molten metal in a mold, pertaining, for example, to a continuous casting apparatus, is supervised by electrical resistance wire probes dipping into the mold and short circuited by the molten metal therein. The resistance change in the circuit is ascertained and used as level indication.

3,667,297

FLUERIC TEMPERATURE SENSOR

Carter Vondell, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Army

Continuation of application Ser. No. 629,867, Apr. 5, 1967, now abandoned. This application May 21, 1969, Ser. No. 831,813
Int. Cl. B21d 28/00
U.S. Cl. 73—339 A 12 Claims



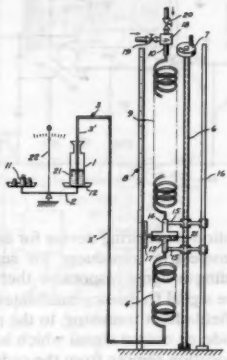
A pressure insensitive, temperature dependent fluid oscillator has a fluid supplied thereto. The frequency of the oscillator is measured indicating the temperature of the fluid. The frequency of the oscillator is made independent of pressure fluctuations by having a choked flow condition exist with regard to the discharge nozzle of the oscillator.

3,667,298

MERCURY MANOMETER

Pierre Chadenson, La Tronche, France, assignor to Societe Generale De Constructions Electriques Et Mecaniques (Alsthom), Grenoble, France

Filed Nov. 9, 1970, Ser. No. 87,855
Claims priority, application France, Nov. 13, 1969, 6939387; July 16, 1970, 7027329
Int. Cl. G01l 7/18
U.S. Cl. 73—405 8 Claims



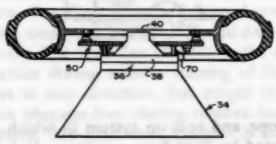
The high precision mercury manometer disclosed herein comprises a container exposed to atmospheric pressure and seated on one of the trays of a balance. Inserted into the container is a vertical portion of a rigid pipe which is coupled at its other end by a flexible connector, to the bottom of a second container exposed either to atmospheric pressure, or to a second pressure to be measured. The second container is displaceable vertically over the length of a scale graduated both above and below the level of the first container. The connection between the two containers constituted of the rigid and flexible conduits has a practically constant volume, irrespective of the change in location of the second container. The first container and the balance may be sealed in a closed chamber which may be exposed either to atmospheric pressure, or to a third pressure between which and the second pressure a differential pressure reading is desired. A connection is provided between the closed chamber and the second container so that the mercury level in the latter may also be subjected to the third pressure.

3,667,299

WHEEL MOUNTING ADAPTOR FOR USE IN WHEEL BALANCING

Warren A. Roberts, 514 Clinton Street, Redwood City, Calif.

Filed May 6, 1970, Ser. No. 35,218
Int. Cl. G01m 1/02; a60c 25/06
U.S. Cl. 73—487 9 Claims



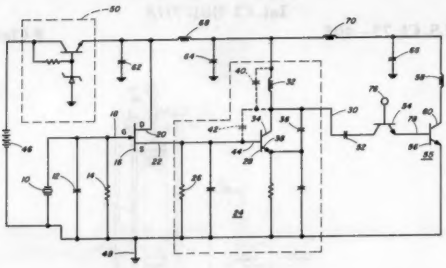
An evenly balanced annular plate for being mounted on the balancing head of a bubble wheel balancer is provided on at least one side with a plurality of rotatably captivated and symmetrically spaced balls for engaging a like plurality of lug holes of a wheel to support the wheel on the balancing head of the bubble wheel balancer.

3,667,300

ACCELEROMETER MONITORING DEVICE

Douglas F. Newell, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 1, 1970, Ser. No. 42,218
Int. Cl. G01p 15/08
U.S. Cl. 73—517 4 Claims



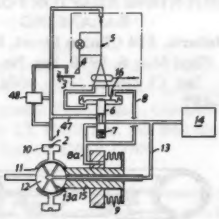
An acceleration monitoring device for an ordnance vehicle having a piezoelectric transducer for sensing acceleration and for providing a signal responsive thereto. The acceleration responsive signal frequency modulates an oscillator connected, via a field-effect transistor, to the piezoelectric transducer to provide an output signal which is transmitted by an antenna to a location remote from the ordnance vehicle. The field-effect transistor directly couples the piezoelectric transducer to the frequency modulated oscillator and, therefore, provides both a transient and a quiescent acceleration response. A Class C buffer amplifier is coupled to the frequency modulated oscillator and the antenna to isolate the oscillator from the adverse effect of detuning which occurs as the ordnance vehicle approaches a target or the like.

3,667,301

CONTROL OF GYROSCOPE SPIN-UP DEVICES

Alan Hugh Kent, Wokingham, and John Christopher Hammond Davis, Wargrave, both of England, assignors to Plessey Telecommunications Research Limited, Taplow, England

Filed Oct. 2, 1970, Ser. No. 77,593
Claims priority, application Great Britain, Oct. 3, 1969, 48,745/69
Int. Cl. G01c 19/26, 19/52
U.S. Cl. 74—5.1 9 Claims



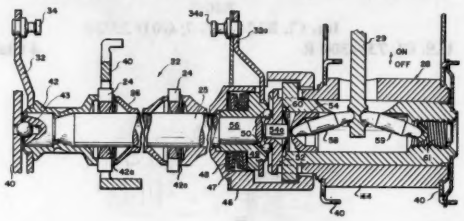
A gyroscope and spin-up system in which the gyroscope rotor is rotated by fluid from a spin-up device. Fluid pulses are generated as a result of fluid from the spin-up device striking pulse-generating fluid-receiving areas provided on the rotor. The number of pulses produced depends upon the speed of the rotor. The pulses act on a resonant means which operates at a predetermined rotor speed to cut off the supply of fluid to the spin-up system.

3,667,302

MEMORY MECHANISM FOR PUSHBUTTON TUNERS

Emery E. Olah, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 13, 1970, Ser. No. 80,295
Int. Cl. F16h 35/18
U.S. Cl. 74—10.37 4 Claims



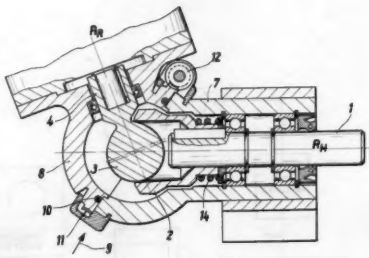
For a pushbutton radio tuner, a mechanical memory mechanism having a plurality of memory cams positioned at axially spaced apart locations on a common shaft. The shaft is rotated by actuation of a pushbutton which has a portion thereof engaging one of the memory elements to tune the radio to a desired preselected radio station. A common lock mechanism is used to unlock all of the cams on the shaft, and friction holding means is provided for each cam to hold the cams that are not being set in a fixed position on the shaft, while other cams are being set on the shaft. The cam being set is moved only under the influence of a setting action by its associated pushbutton.

3,667,303

CONTROL TRANSMISSION

Detlef Hofmann, Eutinger Strasse 7531, Kieselbronn, Germany

Filed Dec. 29, 1970, Ser. No. 102,454
Claims priority, application Germany, Dec. 29, 1969, P 19 65 279.0
Int. Cl. F16h 15/04, 55/34, 15/16
U.S. Cl. 74—190 15 Claims



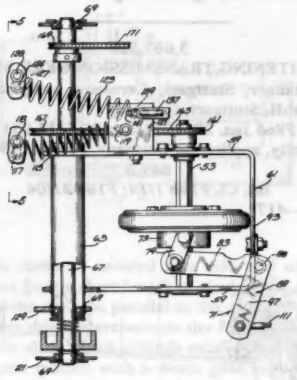
An infinitely variable transmission, which includes an input shaft with a first friction member and an output shaft with a second friction member while one of said friction members is formed by a sleeve with a conical bore and the other friction member is formed by an egg-shaped body of revolution extending into said conical bore and in firm contact with the wall defining said bore for frictional engagement and rotation with said sleeve, said body of revolution being tiltable with regard to the axis of said sleeve for varying the transmission ratio between said input and output shafts.

3,667,304

RIDING LAWN MOWER FRICTION DRIVE

Edward W. Puffer, Galesburg, and Howard K. Duncan, Roseville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 3, 1970, Ser. No. 69,255
Int. Cl. F16h *15/08*
U.S. Cl. 74—197 11 Claims



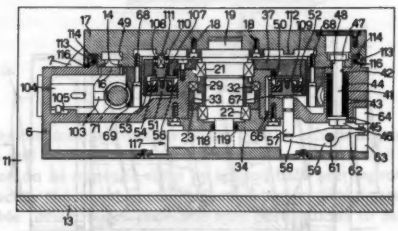
Disclosed herein is a riding lawn mower including a friction drive comprising a rotatably driven disc mounted on a frame, together with a bracket which supports a roller and which is movable relative to a position locating the roller in driving engagement with the disc and means on the frame for biasing the bracket so as to initially engage the roller with the disc with a first normal force and for subsequently increasing the normal force between the roller and the disc.

3,667,305

MACHINE TOOL HAVING A ROTARY WORKTABLE

Michelangelo Rasoira, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed June 18, 1970, Ser. No. 47,319
Claims priority, application Italy, June 21, 1969, 52334-A/69
Int. Cl. B23b *29/32*
U.S. Cl. 74—818 9 Claims



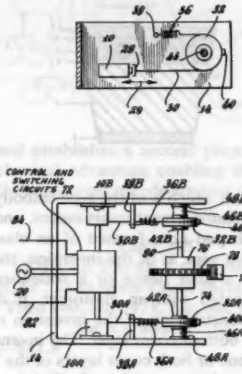
A machine tool having a rotary work-table driven in rotation by a circular gear carried by the work-table cooperating with a worm gear and drive mechanism mounted on the work-table support. The underside of the work-table bears upon a slideway. The work-table is locked to the slideway by means of three equidistant posts biased into clamping relationship with a slot in the slideway. An annular piston operates a linkage that engages the posts, and upon actuation of the piston the posts are moved to a position spaced from the slot to unlock the work-table for rotation. The annular piston also moves a plurality of bearings into engagement with the underside of the work-table to remove the full load thereof from the slideway to facilitate rotation.

3,667,306

DEVICE FOR PROVIDING CONTROLLED MOVEMENT

George L. Bush, Stamford, Conn., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Feb. 16, 1970, Ser. No. 11,746
Int. Cl. F16d *27/10*
U.S. Cl. 74—125.5 4 Claims



A device for moving a member by a controlled amount or to a controlled position. An element undergoing a rotary vibrational movement is coupled to rotate a rotatable member when the element vibrates in one direction but not when the element vibrates in the opposite direction, causing a slight incremental advance of the rotatable member in the one direction for each cycle of the vibrating element.

3,667,307

STEPPING CLUTCH DEVICE

Heinz Kelch, Villingen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Black Forest, Germany

Original application July 15, 1969, Ser. No. 841,773, now Patent No. 3,589,486. Divided and this application Dec. 1, 1970, Ser. No. 94,128
Claims priority, application Switzerland, July 9, 1968, 10833/68
Int. Cl. F16h *27/02*; F16d *67/02*
U.S. Cl. 74—126 10 Claims

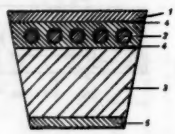
A stepping clutch device has two annular outer members with inner ratchet teeth, and an inner member having first and second sets of resilient arms having pawl portions engaging said ratchet teeth and recesses of said two outer members, respectively. The arms can be bent by the ratchet teeth in radial direction during relative turning of the outer and inner members in one direction, but couple the inner and outer members slippage-free during relative turning in the opposite direction. The first outer member is fixed, and the second outer member is biassed by a spring toward a first end position in one direction of rotation. Electromagnetic means stepwise turn the second outer member in the opposite direction to a second end position so that the inner member is turned in successive steps in one direction by the spring which is wound up by the electromagnetic means after each step.

3,667,308

V-BELT

Johann Schwab, Vienna, and Anna Magritsch, Maria Enzersdorf, both of Austria, assignors to Semperit AG, Vienna, Austria

Filed Nov. 23, 1970, Ser. No. 91,984
Claims priority, application Austria, Dec. 3, 1969, 11267
Int. Cl. F16g 5/16, 1/22
U.S. Cl. 74—233 19 Claims



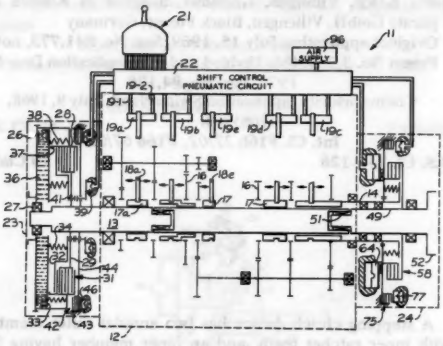
A raw-edged V-belt which is of the type embodying at least a top cover layer, reinforcement insert means, and a substantially trapezoidal-shaped core formed of an elastomer. According to important aspects of the invention, the top cover layer is formed of a fiber fleece or a wide-meshed fabric completely impregnated with an elastomer. If desired, the raw-edged V-belt construction of the invention may further be equipped with a bottom cover layer. The invention further contemplates that one or both cover layers of the V-belt consist of an elastomer of low modulus of elasticity, but higher breaking elongation, than the elastomer of the core.

3,667,309

MULTI SPEED DRIVE TRANSMISSION

Maurice F. Franz, East Peoria; Charles H. Herr, Peoria; Harry B. Newman, Washington, and Philip S. Webber, Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 14, 1970, Ser. No. 80,716
Int. Cl. B60k 29/00, 21/00
U.S. Cl. 74—340 12 Claims



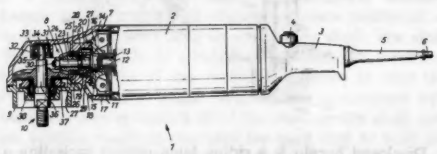
A drive transmission for powered vehicles and the like has change speed gears which may be shifted to provide a selected one of a plurality of drive ratios and has clutches at both the input and output ends whereby the gears may be decoupled from both the driving engine and driven shaft and may then be braked to a stop to facilitate shifting. Brakes are provided at both the input and output ends of the gearing section and a pneumatic control system responds to movement of the operator's shift lever by operating the clutches and brakes in a programmed sequence which assures smooth shifting and avoids damage. Upon movement of the operator's shift lever to a selected setting, the control system simultaneously disengages both clutches and applies both brakes. The control system then energizes fluid operated means for making the appropriate gear interconnections and then sequentially releases the input brake and the output brake. The input clutch is then engaged and finally the output clutch is engaged to reestablish a driving connection between the engine and driven elements. The delay between release of the input and output brakes assures that abutted teeth in the gearing section engage easily at low relative speeds and under only light loading.

3,667,310

SELF-TIGHTENING TRANSMISSION GEAR MOUNTING

Reinhard Hahner, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 29, 1971, Ser. No. 111,031
Claims priority, application Germany, Feb. 20, 1970, P 20 07 849.3
Int. Cl. F16h 1/14; F16d 21/04
U.S. Cl. 74—417 10 Claims



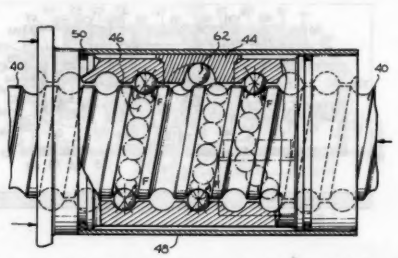
A drive gear is freely mounted on a drive shaft and meshes with an output gear on an output shaft. The meshing teeth are slanted so that a load on the output shaft and output gear, produces an axial force component on the driven gear, urging the same into frictional engagement with a threaded nut so that the same is held against rotation, and moves axially to press the drive gear into tight engagement with an abutment on the drive shaft while the rotating drive shaft screws a threaded portion thereof into the nut.

3,667,311

RECIRCULATING BALL SCREW

Paul V. Wysong, Northridge, Calif., assignor to Schrillo Company, Sepulveda, Calif.

Filed Dec. 9, 1970, Ser. No. 96,340
Int. Cl. F16h 1/18, 55/22, 57/04
U.S. Cl. 74—424.8 R 7 Claims

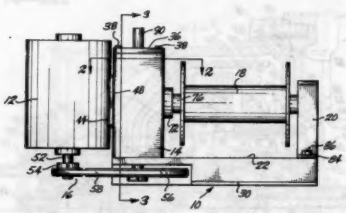


A recirculating ball screw suitable for high speed operation and having an improved lubrication system is disclosed. Recirculation of the balls is accomplished in a smooth and continuous manner by a new ball recirculating member which cooperates with the lead screw to urge the balls out of their normal ball track to transfer the ball over the lead screw in an axial direction and then deposit the ball smoothly back into the ball track without the use of ball pick-up fingers protruding into the ball track. The improved lubrication system is comprised of an outer sleeve which seals the lubricant in place by the use of sealing rings so as to prevent lubricant contamination and unwanted lubricant migration.

3,667,312
DRIVE REDUCTION MECHANISM

Howard C. Dahl, 6420 Nyanza Park Drive, Tacoma, Wash.

Filed Jan. 11, 1971, Ser. No. 105,540
Int. Cl. F16h 1/18; B66d 1/00
U.S. Cl. 74—425 7 Claims

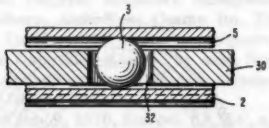


An electric motor is secured to a side wall of a housing formed in part from a short length of stock metal tubing. The drive shaft of the motor is parallel to the axis of the tubing. A belt and pulley drive interconnects the motor shaft with one end of a worm shaft which extends axially through the tubular housing and meshes with a worm gear supported in the housing. The worm gear is secured to an output shaft which projects through a wall of the housing and extends perpendicular to the worm shaft. The worm shaft and the output shaft are supported by bearings contained within bearing housings which are welded to wall or closure portions of the tubular housing.

3,667,313
FLEXIBLE REMOTE CONTROL WITH SPACED BALL BEARINGS

Don L. Young, Jr., Hazelwood, Mo., assignor to Controlex Corporation of America, Croton Falls, N.Y.

Filed Mar. 6, 1970, Ser. No. 17,191
Int. Cl. F16c 1/10
U.S. Cl. 74—501P 2 Claims



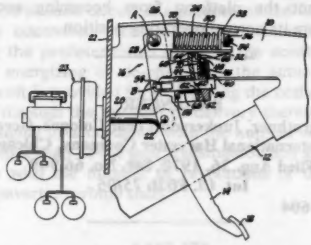
Flexible remote controls of the type in which at least one push-pull blade extends through a tubular sheath and is supported on its opposite sides by spaced balls are improved by replacing the usual metal ball-cage strips with lightweight, flexible plastic strips provided with perforations to hold the balls with the desired spacing.

3,667,314
VARIABLE RATIO LEVER MECHANISM

Thomas E. Ritter, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1970, Ser. No. 92,484
Int. Cl. G05g 1/04
U.S. Cl. 74—518 3 Claims

A variable ratio lever mechanism for a power booster assisted motor vehicle braking system includes a variable ratio fulcrum mechanism which normally establishes a first pivot point providing the relatively low mechanical advantage needed for booster assisted actuation of the brake system. A force sensitive locking mechanism allows the first pivot point to break away when the reaction force acting thereon exceeds that associated with booster assisted break

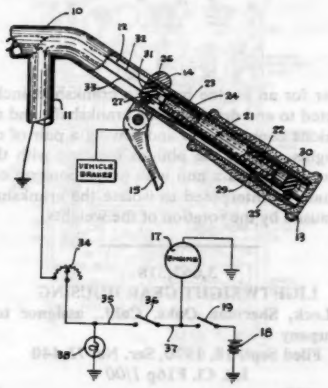


actuation and establishes a second pivot point of relatively higher mechanical advantage enabling the vehicle operator to actuate the break system independent of the booster assist.

3,667,315
VEHICLE HANDLE BAR HEATER

Jack J. Polly, Sr., 2524 Silver Creek Drive, Franklin Park, Ill.

Filed Feb. 10, 1971, Ser. No. 114,134
Int. Cl. B62k 21/12
U.S. Cl. 74—551.8 9 Claims

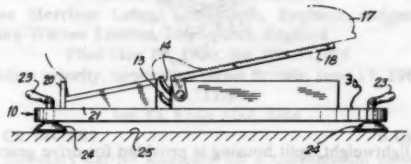


The tubular cross member defining the handle bar of a vehicle, such as a snowmobile, has cartridge heater elements in the tubular interior thereof. The wiring from the cartridge heater extends through the handle bar to the vehicle battery or other source of electricity and includes a heat control and electrical switches.

3,667,316
FOOT PEDAL POSITIONING DEVICE

Rose Valletti, and Angela Arone, both of 241 North Long Beach, Freeport, L. I., N.Y.

Filed Mar. 11, 1971, Ser. No. 123,276
Int. Cl. G05g 1/14
U.S. Cl. 74—560 6 Claims



A positioning device particularly adapted for foot pedal controls and the like consisting of a foot shaped platform for

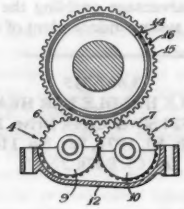
receiving a foot pedal control and including one or more heel stops which automatically position the user's heel in front of the foot pedal control. The platform also includes an anti-friction bottom surface such as foam rubber or suction cups which prevent the platform from becoming accidentally dislodged from its normal operating position.

3,667,317

BALANCER

Franz Hillingrathner, Junkersdorf near Cologne, Germany, assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 26, 1970, Ser. No. 66,949
Int. Cl. F02b *75/06*
U.S. Cl. 74—604 **3 Claims**



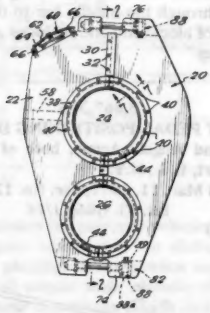
A balancer for an engine having a crankshaft including a gear connected to and driven by the crankshaft, and a pair of meshing pinions connected to and driving a pair of counter-rotating weights, one of the pinions meshing with the gear. The gear has a ring and a hub with projections on each and an elastic material interposed to isolate the crankshaft from vibrations caused by the rotation of the weights.

3,667,318

LIGHTWEIGHT GEAR HOUSING

Harry R. Lock, Sherman Oaks, Calif., assignor to Power Parts Company

Filed Sept. 18, 1970, Ser. No. 73,440
Int. Cl. F16p *1/00*
U.S. Cl. 74—609 **5 Claims**



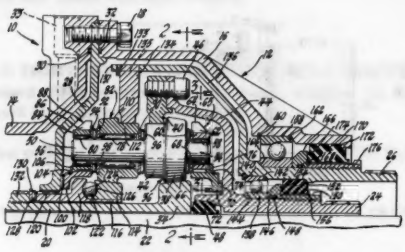
A lightweight, split housing is provided for drive gears for locomotives wheels by a pair of lightweight shells with the open edge on one shell having rigidifying means secured thereto and projecting therefrom for complementary rigidifying cooperation with the open edge of the other shell.

3,667,319

ROLLER TRACTION DRIVE MECHANISM

Milton H. Schelter, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 20, 1970, Ser. No. 56,315
Int. Cl. F16n *37/06, 13/08*
U.S. Cl. 74—665 K **4 Claims**



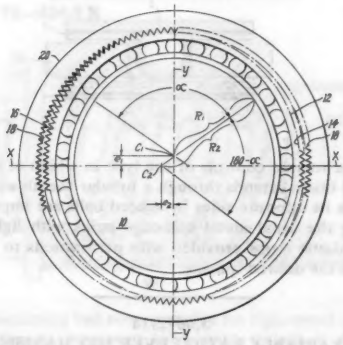
A contrarotating, equal speed-change ratio, dual output compound roller traction driver mechanism from a single input, wherein the single input drives one member of split input sun members. The driven sun members rotates a first set of split planet pinions, the latter, in turn, driving both a carrier member and a first ring member connected to a first output shaft. The driven carrier member rotates the second set of split planet pinions on the other or fixed member of the split input sun members in the opposite direction to that of the first set of planet pinions. The second set of planet pinions, in turn, drives a second ring member connected to a second output shaft for driving the latter at the same speed and torque as the first output shaft and in the opposite direction thereto.

3,667,320

WAVE GENERATOR CONFIGURATIONS

Hugh A. Robinson, Wenham, Mass., assignor to USM Corporation, Boston, Mass.

Filed Jan. 18, 1971, Ser. No. 107,038
Int. Cl. F16h *37/04*
U.S. Cl. 74—640 **1 Claim**



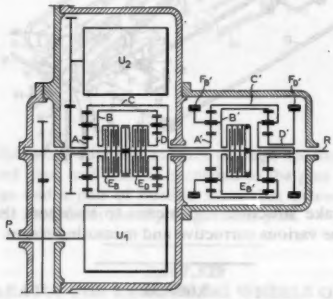
In mechanical harmonic drive actuators, an elliptoidal wave shape is employed to generate a circumferential wave of radial deflection. The present invention provides an improved shape for a wave generator cam, specifically a wave generator plug defined by a pair of arc centered on the major axis, a pair of arc centered on the minor axis, and these arcs sharing common points of tangency. Bending stress is reduced in the deflecting member and better load distribution attained in the wave generator bearing.

3,667,321

CONTINUOUS TRANSMISSION, ESPECIALLY FOR AUTOMOBILE VEHICLES

Jean Maurice, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 7, 1969, Ser. No. 848,310
Claims priority, application France, Aug. 29, 1968, 164477
Int. Cl. F16h 47/04
U.S. Cl. 74—682 7 Claims



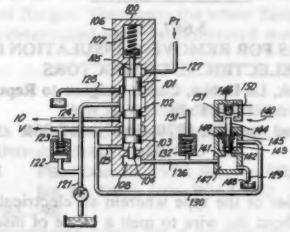
A continuous power transmission device provided between a movement take-off and a receiving shaft, especially for automobile vehicles, comprising a reversible continuous speed-varying device and a planetary train with four elements, in which two elements of said train are continuously active, one of said elements being coupled to the movement take-off through the intermediary of said reversible continuous speed-varying device and the other element being coupled to said shaft, each of the two remaining elements, known as change-over elements being adapted to be rendered active or passive, and further comprising means for rendering one of said change-over elements active while the other element is passive, and vice versa.

3,667,322

OIL PRESSURE CONTROLLING DEVICE FOR AUTOMATIC TRANSMISSION WITH HYDRAULIC TORQUE CONVERTER

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Shigeru Sakakibara, Aichi-Ken; Osamu Ito, Toyota, and Takaaki Kato, Toyohashi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, by said Noguchi, Sumiyoshi, and Sakakibara and Nippon Denso-Kabushiki Kaisha, by said Ito and Kato

Filed July 9, 1970, Ser. No. 53,364
Claims priority, application Japan, July 19, 1969, 44/57145
Int. Cl. F16h 47/06, 5/42; B60k 23/00
U.S. Cl. 74—731 9 Claims



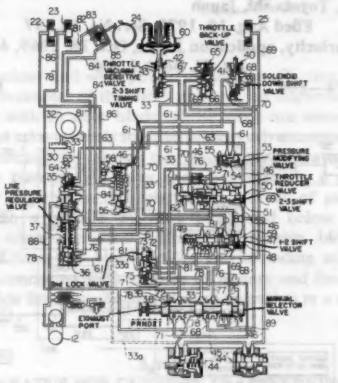
An oil pressure control system is provided in relation to an automatic transmission for vehicles composed of a hydraulic torque converter pump, a hydraulic torque converter turbine, a gear transmission unit incorporating gears and frictionally engaging means, and an oil pressure operating circuit for controlling the engagement and disengagement of the aforesaid frictionally engaging means, said circuit incorporating a constant pressure valve for maintaining the operation oil pressure in such circuit at a predetermined value, an electronically controlled actuator, and an actuating valve for changing the predetermined value of the constant pressure valve by energizing or de-energizing the actuator. A computer circuit is provided for controlling the activation of said actuator through the medium of delivery thereto of, respectively, a signal in accordance with the number of revolutions of the output shaft of the gear transmission and a signal in accordance with the number of revolutions of the hydraulic torque converter turbine shaft.

3,667,323

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Namio Irie, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama City, Japan

Filed Apr. 28, 1970, Ser. No. 32,527
Claims priority, application Japan, Apr. 30, 1969, 44/32720
Int. Cl. F16h 5/42; B60k 21/00
U.S. Cl. 74—752 C 3 Claims



A hydraulic control system for an automotive automatic transmission using a planetary gear set, the control system having a reverse reaction brake which is applied by the motion of a manual selector valve when the selector valve is set to the neutral position with the engine operating and which is prevented from being applied when the vehicle is being driven in a forward direction and the selector valve is shifted from the drive to the neutral position. The manual selector valve is controlled by a governor pressure which may be connected direct to the source of hydraulic pressure.

3,667,324

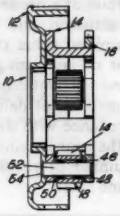
PLANETARY CARRIER ASSEMBLY AND METHOD OF MANUFACTURE THEREOF

James Morrison Laing, Letchworth, England, assignor to Borg-Warner Limited, Letchworth, England

Filed May 15, 1970, Ser. No. 37,795
Claims priority, application Great Britain, June 17, 1969, 30,711/69
Int. Cl. F16h 1/28, 3/44
U.S. Cl. 74—801 6 Claims

A planetary carrier assembly for a transmission in which the support for the planet pinions is provided by a preassembled sheet metal part formed of a support member, a spacer and a plate member secured together by welding. Aligned holes are bored in the three parts after welding to accom-

modate shafts for the pinions, thrust bearing washers being located between the planet gears and the support and plate



members. The pinions are secured by an upsetting operation on the plate member and the support member at adjacent the ends of the pinion shafts.

3,667,325

AUTOMATIC SHIFT CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION FOR VEHICLES

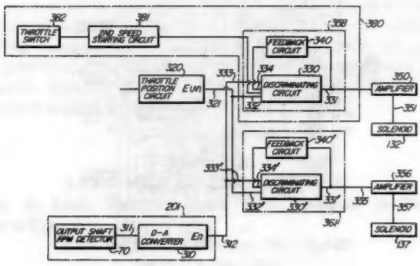
Shin Ito; Seitoku Kubo, and Takakazu Mori, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed Aug. 10, 1970, Ser. No. 62,557

Claims priority, application Japan, Oct. 18, 1969, 44/83413

Int. Cl. B60k *21/00*

U.S. Cl. 74—866 **11 Claims**



An automatic shift control system for an automatic transmission for vehicles having an engine torque responsive signal generator, a vehicle speed responsive signal generator and a plurality of discriminating circuits generating a shift signal when the relation between these signals satisfies a predetermined condition. One of the discriminating circuits is connected to a second speed starting circuit which is connected in turn to a throttle switching which is turned on and off depending on the position of the throttle valve so that the vehicle can be started in the second gear under a low load and in the first gear under a high load to the engine.

3,667,326

DEVICE FOR TESTING THE IMBALANCE OF BALANCE WHEELS

Paul Jahn, Schramberg, and Alfred Kapp, Schramberg-Sulgen, both of Germany, assignors to Gebruder Junghans GmbH., Schramberg, Wurttemberg, Germany

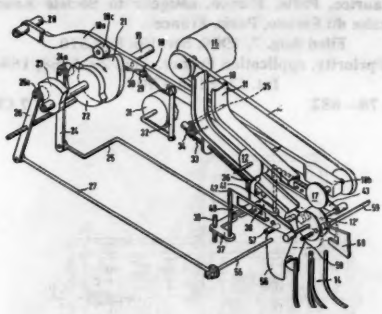
Filed Nov. 16, 1967, Ser. No. 683,724

Claims priority, application Germany, Nov. 16, 1966, J 32260

Int. Cl. B23b *41/00, 49/00*

U.S. Cl. 408—16 **1 Claim**

A device for testing, finding and eliminating any imbalance of a rotary body such as a balance wheel of watches and clocks having various elements to measure imbalance and equilibrate the body to its desired correct balance. The device includes measuring means, correction tools, drilling



means, brake structure and means to transport the bodies through the various corrective and measuring stages.

3,667,327

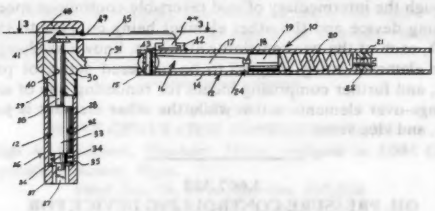
MANUALLY OPERATED MARKING TORQUE WRENCH

Christopher James Lance, Royal Oak, Mich., assignor to Ivan F. Belknap, Detroit, Mich., a part interest

Filed July 13, 1970, Ser. No. 54,465

Int. Cl. B25b

U.S. Cl. 81—52.4 **13 Claims**



A marking wrench has a conventional torque-limiting, overcenter connection between its operating handle and a tubular socket-type wrench. The handle fixedly mounts an elongated, laterally offset and forwardly extending operator arm, which extends just beyond the axis of the wrench socket, at one side of that axis. The socket end slidably guides a plunger or tappet coaxial with the socket; and a conical cam element at the top of the tappet is engaged cammingly by the operator arm when the over-center connection is broken. This causes the tappet to operate a felt-tipped marker to mark a fastener engaged by the socket jaw, the marker being coaxially slidable in the socket.

3,667,328

APPARATUS FOR REMOVING INSULATION FROM ELECTRICAL CONDUCTORS

John D. Stolshek, La Habra, Calif., assignor to Republic Corporation, Beverly Hills, Calif.

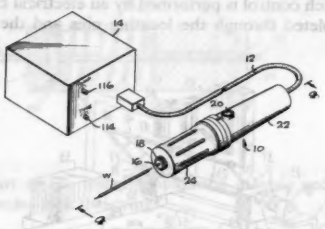
Filed Aug. 31, 1970, Ser. No. 68,066

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.5 **13 Claims**

A wire stripper of the type wherein an electrically heated blade rotates about the wire to melt a circle of insulation so that an end piece of insulation can be pulled off. A circuit for energizing the device operates for a preset time at a predetermined current, to assure melting of insulation to the required depth without damaging the central conductor and to minimize the time of the operation. A blade support extends

along a side of the blade opposite the side that contacts the wire, to support the blade against deflection, and to help confine heat to the blade. The blade is an easily replacable element whose opposite end extends through apertures in a pair of spaced pins, and current is carried to the pins by a pair of slip rings and a pair of flexible wires that extend in helixes about the shaft from the slip rings to the pins.

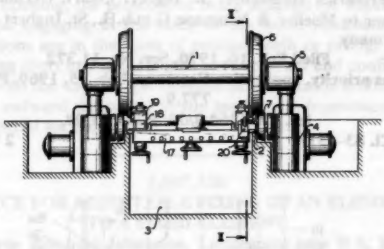


3,667,329

APPARATUS FOR REWORKING WHEELS ON A RAIL VEHICLE

Theodor Dombrowski, Erkelenz, Germany, assignor to Wilhelm Hegenscheidt Kommanditgesellschaft, Erkelenz, Germany

Filed Dec. 16, 1969, Ser. No. 885,398
Claims priority, application Germany, Dec. 19, 1968, P 18 15 689.3
Int. Cl. B23b *5/28*
U.S. Cl. 82—8 **9 Claims**



A rail vehicle is supported so that its wheels have freedom to rotate, and thereupon the wheels are engaged and supported. The wheel flanges of the wheels are turned until they are centrical and cylindrical. The diameter of the thus turned wheel flanges is measured and the desired new circumferential configuration of the wheel rims is determined as a function of measurement taken with reference to the axis of rotation of the wheels and with reference to the diameter of the wheel flanges. Thereupon the wheel flanges are turned to the thus determined new circumferential configuration.

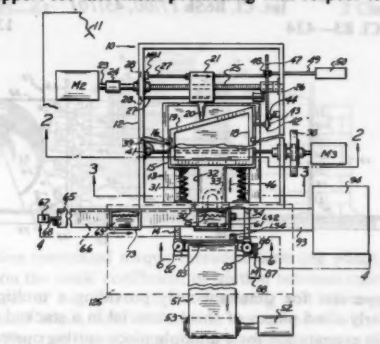
3,667,330

MICROTOME ASSEMBLY

Sidney D. Kobernick, Birmingham, Mich., assignor to Devco, Inc., Detroit, Mich.

Filed Dec. 16, 1970, Ser. No. 98,606
Int. Cl. G01n *1/06;* **B26d** *7/02, 7/08*
U.S. Cl. 83—98 **18 Claims**

In a microtome which has a housing on a support a carriage adapted for forward feed and retraction movements in a horizontal plane and mounting a vertically adjustable head which supports a forwardly extending block holder adapted to mount a tissue specimen containing block adapted for vertical slicing movements with respect to a stationary knife and with each vertical slicing movement accompanied by incremental horizontal feed movement of the block towards the knife for successive slicing thereof; the improvement for said microtome which includes a block holder on the forward end of the head preformed to snugly receive the tissue block to be sliced and with a magnet for holding the tissue block within the block holder, a power operated reciprocal block support carrier and cassette for the storage of blocks to be sliced and for delivering said blocks one at a time to the block support for increment positioning with respect to the



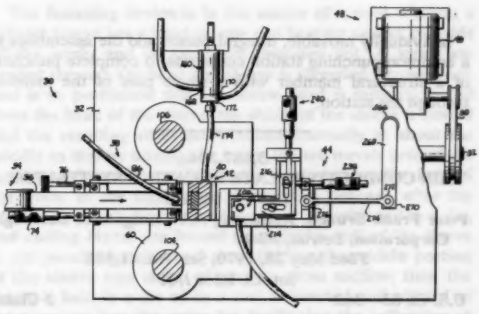
block holder and with power means for effecting automatic feed movements of the block support, an improved knife assembly with flexible blade whose ends are mounted upon feed and take-up reels for intermittent advancement, a motor for advancing the take-up reel, the power operated conveyor belt for transporting away specimen slices in a continuous manner together with a chute for delivery of partly sliced blocks to a storage chamber positioned below the block holder when retracted adapted to receive blocks when released from the block holder and including an electrical circuit connected with a series of motors and limit switches to provide for an automatic cycling operation in a continuous manner.

3,667,331

APPARATUS FOR CUTTING, TRANSFERRING AND DEPOSITING SELF-SUPPORTING STRIP MATERIAL

John Jacob Regec, Emporium, Pa., and Henry William Roeber, Waterloo, N.Y., assignors to Sylvania Electric Products, Inc.

Original application Feb. 20, 1969, Ser. No. 801,114, now Patent No. 3,598,009. Divided and this application Jan. 25, 1971, Ser. No. 109,187
Int. Cl. B26d *7/06*
U.S. Cl. 83—98 **1 Claim**



Apparatus for performing the title functions with thick film resistor or capacitor material. The material is fed in discrete

increments to a cutting head which severs selected portions and transports the same to a remote location where it is deposited across conductors formed on an insulating substrate.

3,667,332

APPARATUS FOR STACKING FABRIC FOR PATTERN CUTTING

Robert M. Kirche, 411 West Arbor Vitae, Inglewood, Calif.

Filed Apr. 19, 1971, Ser. No. 135,058
Int. Cl. B65h *17/00, 45/101*
U.S. Cl. 83—424 **13 Claims**

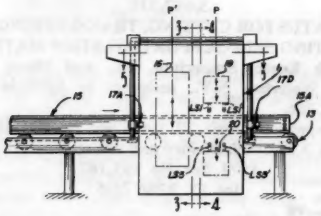
Apparatus for simultaneously providing a multiplicity of similarly sized pieces of sheet material in a stacked relationship in preparation for a multiple piece cutting operation employed in the garment and piece good industry. A movable carriage and clamping arrangement withdraws in one pass, a plurality of overlying lengths of sheet material from a single supply roll or bolt of material. Further provision is made to individually sever the overlying lengths after the withdrawal takes place.

3,667,333

SINGLE PASS STRUCTURAL SHAPE PUNCH

Benjamin Harrison Flynn, Jr., P.O. Box 5755, 1629 Fulton Drive, Alexandria, La.

Filed Sept. 30, 1970, Ser. No. 76,918
Int. Cl. B26d *9/20*
U.S. Cl. 83—255 **6 Claims**



Individually movable, integral punch and die assemblies at a common punching station cooperate to complete punching of a structural member with a single pass of the member through the station.

3,667,334

THIN CONDUCTIVE PLATE LOCATING SYSTEM FOR A PUNCH PRESS

Peter Frank Brunett, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 28, 1970, Ser. No. 41,508
Int. Cl. B26f *1/02*
U.S. Cl. 83—362 **3 Claims**

The invention relates to a system for accurately aligning a thin conductive plate relative to a plurality of punch dies for making holes in the plate which are accurately aligned with respect to one edge. The system employs spaced conductive pins on the plate supporting bed of the machine for guiding the plate into position and for indicating that the plate is in position and ready for punching. The plate position sensing and punch control is performed by an electrical circuit which is completed through the locating pins and the conductive

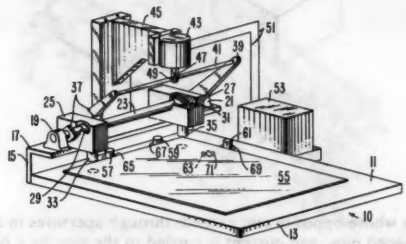


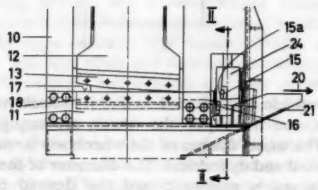
plate. Time delay devices are employed in the control circuit to preclude premature operation of the punch due to accidental completion of the sensing circuit during the initial placement of the plate into the punch. The sensing circuit must be closed for an interval of time before the control circuit automatically initiates punching action.

3,667,335

EDGE TRIMMING SHEARS FOR ROLLED METAL SHEETS WITH CROSS-KNIVES FOR SEVERING THE EDGE STRIPS

Paul Friedrich Hamacher, St. Ingbert (Saar), Germany, assignor to Moeller & Neumann G.m.b.H., St. Ingbert (Saar), Germany

Filed Feb. 16, 1970, Ser. No. 11,372
Claims priority, application Germany, Feb. 15, 1969, P 19 07 777.9
Int. Cl. B26d *9/00;* **B23d** *17/04*
U.S. Cl. 83—513 **2 Claims**



A straight-knife edge trimming shears more particularly suitable for opposite mounting in shearing lines for cutting thick sheets whose cross-knife for severing the edge strips still connected to the sheet after the cutting by the edge trimming knife has an independent drive and starts its cutting action after the edge trimming knife mounted ahead of the cross-knife.

3,667,336

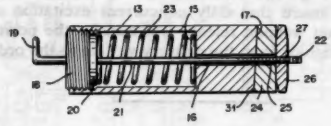
MECHANICAL TUNER FOR STRING INSTRUMENTS

Sidney Itzler, and Robert G. Towle, both of New City, N.Y., assignors to Sidney Itzler, New City, N.Y.

Filed July 12, 1971, Ser. No. 161,518
Int. Cl. G10d *3/00;* **G10g** *7/02*
U.S. Cl. 84—454 **4 Claims**

The invention relates to a mechanical tuner for stringed in-

struments which permits student players to rapidly tune and retune their instruments and is characterized by the tuner



forming a part of the instrument during playing and being mounted in series with the string.

3,667,337

GRIP PLATE FOR WOODEN TRUSS MEMBERS

James Stanley Burke, 2675 S.W. 69th Court, Miami, Fla.

Filed June 11, 1970, Ser. No. 45,330

Int. Cl. F16b *15/00*; A43b *23/20*

U.S. Cl. 85—13 **1 Claim**

Grip plates or connectors for wooden structural members, preferably metal, provided with a plurality of integral punched projections in circular arrays or clusters about a center opening, the projections being adapted for impressing into and engaging in the body of the wood members. The projections are in the form of pointed teeth or prongs of alternating short and long lengths with different end configurations, with the tooth edges bevelled at their inside surfaces to impart outward deflection to the teeth upon impression into the material for enhanced retention therein.

3,667,338

DEVICE FOR ADJUSTABLE FIXING OF AN ELEMENT TO A FIXED ELEMENT

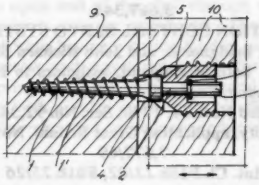
Rolf Arne Reinhold Johansson, Lundegrens gata II b, Kungsbacka, Sweden

Filed Oct. 10, 1969, Ser. No. 865,245

Claims priority, application Sweden, Dec. 16, 1968, 17184

Int. Cl. F16b *25/00*

U.S. Cl. 85—41 **1 Claim**



Screw device for adjustable interconnecting two elements, such as a wall and a door frame, comprising a screw member to be screwed into one of the elements having a head portion adapted to be engaged by a wrench or similar tool and an externally screw threaded tubular nut member to be screwed into the other element, and which rotatably surrounds the head portion while being maintained against axial displacement, the nut member having a socket for receiving the head portion in spaced relationship to provide access for a tool to selectively rotate the screwhead and the nut for adjustment of the spacing between the elements and to lock the screwhead and the nut against relative movement.

3,667,339

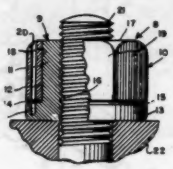
FRICTION CONTROLLED TORQUE FASTENING

Richard E. Dame, 12625 Billington Road, Silver Spring, Md.

Filed Mar. 30, 1971, Ser. No. 129,545

Int. Cl. F16b *31/02*

U.S. Cl. 85—61 **2 Claims**



A friction controlled torque threaded fastening which depends upon the static coefficient of friction between contacting surfaces of two parts of the fastening and the normal forces which retain said surfaces in engagement with one another. The two parts comprise an inner section or core having a threaded portion and an outer section or shell. The shell has a cylindrical bore of a diameter less than the diameter of a peripheral surface of circular cross section of the core which is applied to the bore by a shrink fit connection. The shell and core are formed of the same material so that the connection can be accomplished by heating the shell and cooling the core.

3,667,340

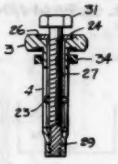
FASTENING DEVICE AND METHOD OF MAKING SAME

Daniel A. Black, Pittsburgh, Pa.; Albert A. Ingersoll, Santa Ana; Ira Bill Lee York, Costa Mesa, and David O. Jones, Tustin, all of Calif., assignors to Textron Inc.

Filed Apr. 29, 1970, Ser. No. 32,970

Int. Cl. F16b *13/04*

U.S. Cl. 85—71 **1 Claim**



The fastening device is in the nature of a rivet wherein a tubular sleeve has a head on one end bearing against one side of the work, and an internally threaded tail. A screw extended through the head and sleeve is threaded into said tail, and is so positioned that the screw head is initially spaced from the head of the sleeve; the shank of the sleeve is slotted and the resulting strips are notched internally at about the middle so that by turning the screw the tail travels toward the head and the strips are folded flat against the other face of the work. In the method of making this fastener, after the hollow rivet with the head is formed, it is positioned in a die, and cutting blades are forced through the wall of the sleeve to cut parallel longitudinal slots dividing the middle portion of the sleeve into strips of arcuate cross section; then the sleeve is held in a die while a tool is inserted and rotated to cut a groove into the strips for facilitating the collapsing of the sleeve; then the screw is inserted into the sleeve and the tail of the sleeve is pressed or swaged into the screw to form

the internal thread in the tail and hold the screw. The shank between the sleeve head and the adjacent ends of the slots is approximately equal to the minimum thickness in which the fastener is used. The sleeve head has a recess in both faces to accommodate suitable washers.

3,667,341

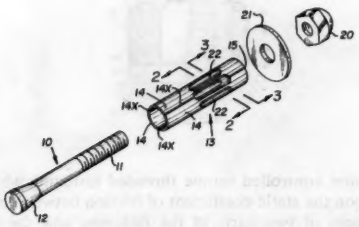
ANCHOR BOLT

Stanley Kaplan, 10 Grover Avenue West, Massapequa, N.Y.

Filed July 6, 1970, Ser. No. 52,453

Int. Cl. F16b *13/06*

U.S. Cl. 85—77 **1 Claim**



This invention relates to an improvement in anchor bolts having a plurality of slots forming sleeve legs having bridge portions of narrow width, said legs being moved outwardly in a drilled masonry well or hole to rigidly engage the well wall upon suitable operation of the bolt. The improvement consists of the provision of suitable stampings in said bridge portions to form projections adapted to engage the well wall in non-rotative engagement upon insertion in a well. Moreover, the stamped out projection re-enforces the narrow bridge portion of the sleeve thereby preventing premature collapse or rollback upon insertion in close-fitting holes.

3,667,342

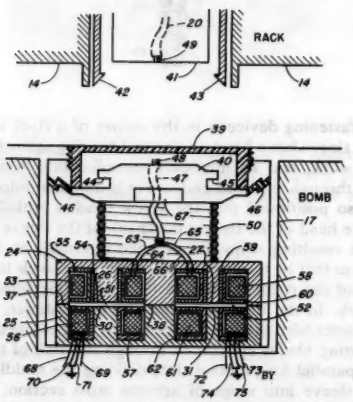
MAGNETIC WEAPON LINK TRANSDUCER

Frederick E. Warnock, Bethesda, and John H. Malloy, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 8, 1970, Ser. No. 26,479

Int. Cl. B64d *1/04*

U.S. Cl. 89—1.5 D **7 Claims**



A magnetic weapon link transducer transfers both power and option information signals from an ordnance delivery vehicle to an ordnance device. The transducer includes a plurality of magnetic cores of diverse diameters located in excitation and load units, respectively. Airgaps, which may be of diverse thicknesses, separate corresponding cores on the excitation and load units. Individual AC and RF shields are included to insure that only concurrent excitation of the transducer and weapon release will transfer the power and information signals from the delivery vehicle to the ordnance device.

3,667,343

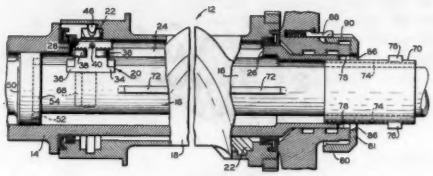
MEANS FOR ATTACHING BARREL TO CROSSOVER SLIDE FOR QUICK REPLACEMENT

Chester P. Jurkowski, Budd Lake, and Mitsie W. Kruzel, Flanders, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 30, 1969, Ser. No. 889,115

Int. Cl. F41f *17/00*

U.S. Cl. 89—161 **8 Claims**



In an automatic gun comprising a drum journaled for rotation around the exterior of the receiver and a barrel disposed for reciprocation therein, a crossover slide is slidingly mounted in a longitudinal slot through the receiver and is slidingly engaged with cam tracks in the drum to convert rotation thereof to translational movement and transmit the translational movement through the receiver. Flanges on the crossover slide are engageable by cooperating flanges on the barrel responsive to rotation thereof to connect the crossover slide to the barrel for translation therewith. A sleeve is slidingly mounted on the barrel and is provided with a lug receivable by a recess in the receiver and longitudinal grooves slidingly engaged with cooperating ribs on the barrel to prevent relative rotation of the barrel and receiver when the lug is located in the recess. The sleeve is blocked against displacement to maintain the lug in the recess by locking collar rotatingly mounted to the receiver by bayonet lug means.

3,667,344

POSITION CONTROL SERVO SYSTEMS

Roy Westbury, Bridgnorth, and John Richard Simmons, Wolverhampton, both of England, assignors to H. M. Hobson Limited, London, England

Filed Nov. 24, 1970, Ser. No. 92,343

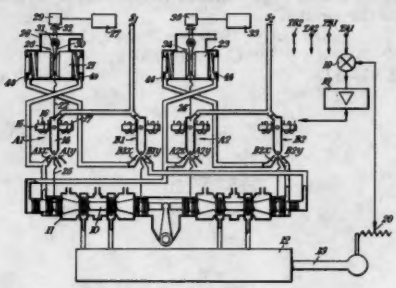
Claims priority, application Great Britain, Nov. 25, 1969, 7,677/69

Int. Cl. F15b *13/02*; F01b *25/26*

U.S. Cl. 91—1 **6 Claims**

A position control servo system comprising a hydraulic actuator controlled by a fluid control valve which is responsive to output signals applied to it from a pair of transducers, each of which is responsive to an input signal applied thereto to produce an actuator output which a function of the input signals, which are in normal operation substantially equal, and control means responsive to a difference between the transducer output signals up to a predetermined and allowable difference to adjust on or the other or both of the trans-

ducers and/or input signals thereto, thereby to maintain the tranducer output signals within the predetermined and al-



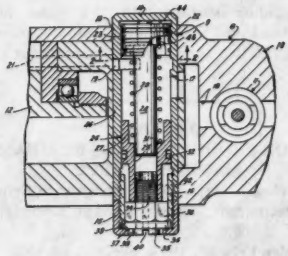
lowable difference and to produce an indication when the difference is exceeded.

3,667,345

AIR SHUT-OFF TORQUE RESPONSIVE CONTROL VALVE UNIT FOR PNEUMATICALLY POWERED TOOLS

Raymond J. Schaedler, and Lester A. Amtsberg, both of Utica, N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,059
Int. Cl. B23b *45/04*
U.S. Cl. 91—59 9 Claims



A completely assembled air shut-off control valve unit illustrated as fitted in a bore of a pneumatically powered nut runner in the path of air flow between the throttle valve and the motor. The unit is of capsule form defined by means of a shell in which the various components are confined. A cap closes over an open end of the shell through which end the various components may be withdrawn. The valve is of a piston and rod form having a spring load in association with an adjusting screw and travel nut means for adjusting the load of the spring upon the valve. Structural design of the valve, together with a valve guide serve to effect pneumatic balancing of the valve and consequent reduced friction in its movement.

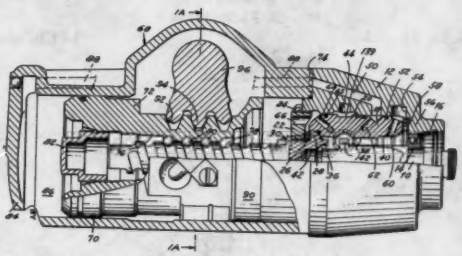
3,667,346

FLUID CONTROL VALVE FOR A HYDROSTATIC POWER BOOSTING MECHANISM FOR AN AUTOMOTIVE STEERING GEAR

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1970, Ser. No. 85,013
Int. Cl. F15b *9/10*
U.S. Cl. 91—375 A 7 Claims

A power boosting mechanism for an automotive vehicle steering gear comprising a pressure operated piston connected mechanically to a steering member for the dirigible wheels of an automotive vehicle, pressure passages extending to opposed sides of said piston, a steering shaft, a ball valve assembly situated in each passage including a ball valve element and a surrounding valve seat in fluid communication



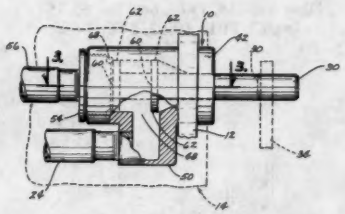
with said passage, an outlet flow controlling valve seat formed in said piston, means carried by the steering shaft for shifting said ball valve elements into and out of registry with the respective valve seats during application of steering effort to said steering shaft thereby controlling pressure distribution to said opposed sides of said piston.

3,667,347

STROKE CONTROL DEVICE FOR HYDRAULIC CYLINDERS

Donald A. Patrick, Sergeant Bluff, Iowa, assignor to Prince Manufacturing Corporation, Sioux City, Iowa

Filed May 22, 1970, Ser. No. 39,656
Int. Cl. F15b *13/04*
U.S. Cl. 91—404 1 Claim



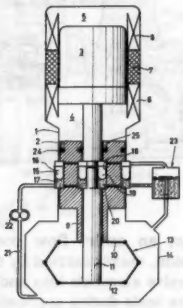
A hydraulic cylinder including a piston rod extending from one end and having adjustable actuating member thereon for engaging the piston rod of a control cylinder in communication with the hydraulic cylinder such that oil is circulated from the hydraulic cylinder through the control cylinder and is shut off upon the actuating element moving the control cylinder piston rod to a closed position thereby limiting further movement of hydraulic oil within the hydraulic cylinder. A double or single acting hydraulic cylinder may be employed and upon fluid flowing in a reverse direction the control cylinder piston will be extended opening the conduit from the hydraulic cylinder through the control cylinder unit for oil circulation. The piston in the control cylinder is entirely metallic and engages an elastomeric seat seal only after the oil pressure has substantially dropped due to the inlet opening into the cylinder having been closed off by the control cylinder piston moving across the inlet opening. The control cylinder may be externally mounted on the hydraulic cylinder.

3,667,348

SEALS BETWEEN COAXIAL ELEMENTS

Gregorius Theodorus Maria Neelen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 1, 1970, Ser. No. 24,506
Claims priority, application Netherlands, Apr. 17, 1969, 6905901
Int. Cl. F15b *21/04*
U.S. Cl. 92—83 11 Claims



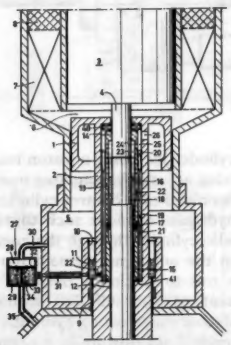
An apparatus such as a hot gas engine and a compressor has a rolling diaphragm seal between adjacent walls of a piston and cylinder and supported by a liquid, and has an additional piston ring seal between the diaphragm seal and gas space above, this ring seal having an operative diameter equal to the effective diameter of the diaphragm seal for maintaining constant the volume above said diaphragm seal.

3,667,349

SEAL FOR PISTON-CYLINDER ASSEMBLY

Hans Joachim Siebert, Gersthofen, Germany, and Gregorius Theodorus Maria Neelen, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,354
Int. Cl. F01b *19.02;* F16j *3/00*
U.S. Cl. 92—83 6 Claims



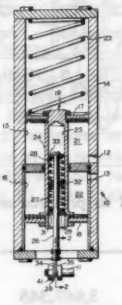
A seal for use with a piston rod and a cylinder assembly or subassembly, where an annular space between the piston rod and cylinder is separated by a sleeve into two annular spaces. The sleeve is axially fixed but radially movable relative to the cylinder, and radially fixed but axially movable relative to the rod, with a rolling diaphragm seal secured between the sleeve and rod.

3,667,350

PNEUMATIC TORQUE MOTOR UNIT

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation

Filed Oct. 9, 1970, Ser. No. 79,424
Int. Cl. F01b *3/00*
U.S. Cl. 92—113 3 Claims



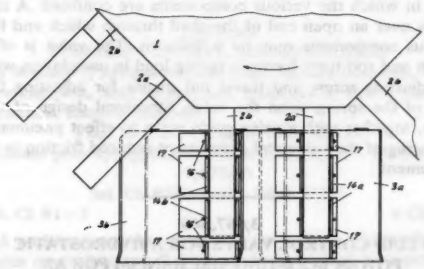
The disclosure concerns pneumatic torque motor apparatus for resisting rotation of a shaft in opposite directions from a null position. The resisting torque is developed by a pair of series-connected calibration springs which are loaded by the piston of a pneumatic motor, and which act upon a drive rod which engages the shaft through flat bearing surfaces on an attached yoke and cooperating knife edges carried by a rocker member fixed to the shaft. One end of the drive rod is guided for reciprocation within the piston by a low friction head, and its tilting movement is limited by cooperating guiding surfaces on the yoke and rocker member. The head and a low friction annular member interposed between the two springs serve as seats for the calibration springs.

3,667,351

DEVICE FOR PRODUCING BAGS BY MEANS OF A MANDREL WHEEL

Alwin Egli, Beringen, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfalt, Switzerland

Filed Feb. 20, 1970, Ser. No. 13,132
Claims priority, application Switzerland, Feb. 25, 1969, 2819/69
Int. Cl. B31b *1/32, 1/64;* B31c *1/02*
U.S. Cl. 93—12 R 1 Claim



A device for producing tubular wrappings for paper bags with a mandrel wheel rotating stepwise in a horizontal plane and having horizontally outwardly extending pairs of spaced parallel folding mandrels. The blanks of bag material are fed horizontally toward a position below the folding mandrels and are brought into contact pressure with a bottom face of

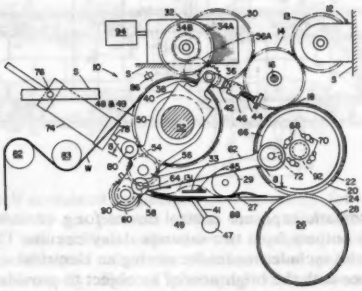
the folding mandrels by upwardly moving folding boxes, whereupon a folding fork associated with each folding box moves upwardly to place and wrap the blanks against the sides and around the folding mandrels with the assistance of compressed air.

3,667,352

LOOP STABILIZE WEB FED VARIABLE REPEAT CUTTER-CREASER SYSTEM

Richard W. Helmig, Baltimore, and Floyd Steinmetz, Timonium, both of Md., assignors to The Rotographic Machinery Company, Baltimore, Md.

Filed Apr. 16, 1970, Ser. No. 29,103
Int. Cl. B31b *1/20*; B65b *57/02*; B31b *1/10*
U.S. Cl. 93—58.2 R **24 Claims**



A web fed rotary variable repeat cutter-creaser system is provided for the packaging industry which is fed from a web stock of material either printed or unprinted or both. This system consists basically of a pair of large diameter, very heavy walled drums on which is mounted a pair of cutting and creasing dies. These dies are in the form of a sheet metal blanket into which the shape to be cut and creased has been chemically milled. The dies are mounted on these two drums so that as they rotate together, with the dies being matched one to another in a registered position.

A feeder is provided for the die cylinders which has the qualities of feeding a selected length of material, yet is continuously supplied from roll web stock of material. A crank working directly from the die cylinders forms storage loops in the web and advances it periodically. Swing rolls are oscillated by the crank arm and these are geared to a mechanism for advancing or retarding the fed portion of the web of material in accord with registration marks on the web stock. Apparatus is provided for stabilizing the storage loops at high speeds to prevent the loops from distorting and doubling back on itself. Also, an arrangement is provided to create a definite bend in the web so that the break or start of the storage loop occurs at a predetermined point in the system during operation thereof.

3,667,353

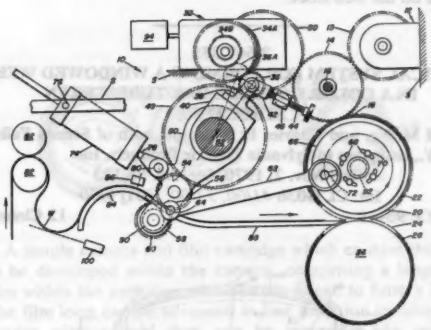
WEB FED ROTARY VARIABLE REPEAT CUTTER-CREASER SYSTEM

Henry D. Ward, Jr., Phoenix, and Floyd Steinmetz, Timonium, both of Md., assignors to The Rotographic Machinery Company, Baltimore, Md.

Filed July 10, 1968, Ser. No. 743,748
Int. Cl. B31b *1/16*
U.S. Cl. 93—58.2 R **19 Claims**

A web fed rotary variable cutter-creaser system is provided for the packaging industry which is to be fed from a web stock of material either printed or unprinted or both. This system consists basically of a pair of large diameter, very heavy walled drums on which can be mounted a pair of cutting and creasing dies. These dies are in the form of a sheet metal blanket into which the shaped to be cut and creased have been chemically milled. The dies are mounted on these two drums so that as they rotate together, the dies will match one another in a registered position.

A feeder is provided for the die cylinders which has the



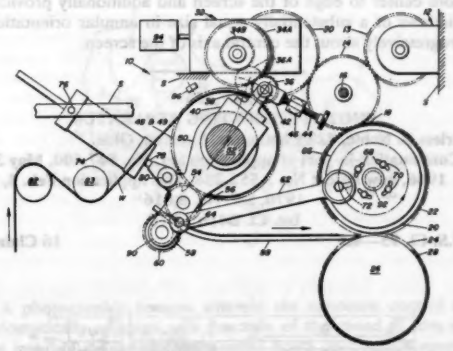
qualities of feeding a selected length of material, yet is continuously supplied from a roll web stock of material. A crank working directly from the die cylinders forms storage loops in the web and advances it periodically. Swing rolls are oscillated by the crank arm and these are geared to a mechanism for advancing or retarding the fed portion of the web of material in accord with registration marks on the web stock.

3,667,354

WEB FED ROTARY VARIABLE REPEAT CUTTER-CREASER SYSTEM

Floyd Steinmetz, Timonium, Md., assignor to The Rotographic Machinery Company, Baltimore, Md.

Filed Jan. 30, 1969, Ser. No. 795,326
Int. Cl. B31b *1/16, 17/14*; B65b *57/00*
U.S. Cl. 93—58.2 R **18 Claims**



A web fed rotary variable repeat cutter-creaser system is provided for the packaging industry which is to be fed from a web stock of material either printed or unprinted or both. This system consists basically of a pair of large diameter, very heavy walled drums on which can be mounted a pair of cutting and creasing dies. These dies are in the form of a sheet metal blanket into which the shape to be cut and creased have been chemically milled. The dies are mounted on these two drums so that as they rotate together, the dies will match one another in a registered position. A feeder is

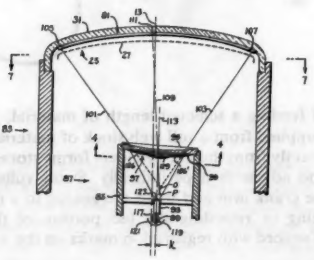
provided for the die cylinders which has the qualities of feeding a selected length of material, yet is continuously supplied from roll web stock of material. A crank working directly from the die cylinders wraps a storage integral of the web about a drum, then unwraps and advances it periodically. Swing rolls are oscillated by the crank arm and these are geared to a mechanism for advancing or retarding the fed portion of the web of material in accord with registration marks on the web stock.

3,667,355

OPTICAL SYSTEM FOR FORMING A WINDOWED WEB IN A COLOR CATHODE RAY TUBESCREEN STRUCTURE

David M. Ng, and Charles H. Rehkope, both of Seneca Falls, N.Y., assignors to Sylvania Electric Products, Inc.

Filed Nov. 2, 1970, Ser. No. 86,123
Int. Cl. G03b *41/00, 33/00;* H01j *9/00*
U.S. Cl. 95—1 **12 Claims**



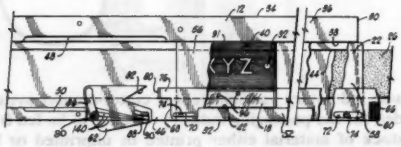
An improvement is provided in the optical system utilized for photo-forming the multiple window pattern defined by the opaque interstitial web portion of a CRT composite screen structure. Exposure illumination from an elongated primary light source is selectively modified by a composite light attenuation coating of nonsymmetrical density discretely disposed relative to the lens in the pattern exposure system. The vapor disposed coating is heavier in the generic form of a modified lemniscate which selectively modifies the photo exposure to effect a variable gradient of window sizes from center to edge of the screen and additionally provides windows of a substantially equal size in annular orientation progressively about the central axis of the screen.

3,667,356

PHOTOTYPESETTING APPARATUS

Arless B. Noble, 428 Chatauqua, Norman, Okla.

Continuation-in-part of application Ser. No. 547,400, May 3, 1966, now Patent No. 3,552,284. This application Feb. 5, 1970, Ser. No. 8,816
Int. Cl. B41b *13/10*
U.S. Cl. 95—4.5 **16 Claims**



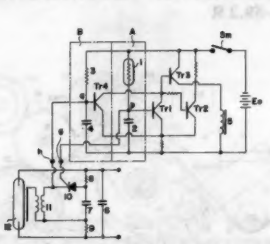
A phototypesetting apparatus for imprinting typographical characters on a photosensitive material, including a character spacing assembly having a stop edge and a leading edge formed therein, the distance therebetween defining a character spacing gap, the character spacing gap being shaped and disposed, to cooperate with an indexing slide, having a photomatrix affixed thereto, to positively control the movement of the photosensitive material within the character spacing gap, thereby assuring a consistent, predetermined character spacing of the characters on the photosensitive material.

3,667,357

AUTOMATIC CONTROL DEVICES FOR A CAMERA

Motonobu Matsuda, Sakai-shi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1969, Ser. No. 884,568
Claims priority, application Japan, Dec. 24, 1968, 43/94807; Dec. 31, 1968, 44/728; Feb. 24, 1969, 44/16349
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 CT **6 Claims**



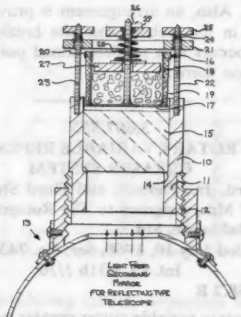
An automatic exposure control device for a camera is actuated by outputs from two separate delay circuits. The first delay circuit includes means for storing an electrical signal in accordance with the brightness of an object to provide a first output, and the second delay circuit includes means for storing an electrical signal representative of a desired flash time delay to provide a second output. A switching circuit is responsive to the first and second outputs whereby a flash circuit is actuated only when the second output exceeds the first output. A modified embodiment incorporates a third delay circuit and the flash is actuated only when the first output is less than the third output or when the first output exceeds the third output which in turn exceeds the second output. The first and second delay circuits are respectively responsive to the brightness of the entire picture and a central portion of the picture, whereas the third delay circuit provides the desired flash time delay.

3,667,358

COLD EMULSION CAMERA

William D. Williams, Jr., 2 Heather Lane, Manwah, N.J., and Scott Usher, 98 Copley Avenue, Teaneck, N.J.

Filed Jan. 5, 1971, Ser. No. 103,981
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 R **6 Claims**



A cold emulsion camera in which the film is gripped between an optical plug and a metallic plate, which is

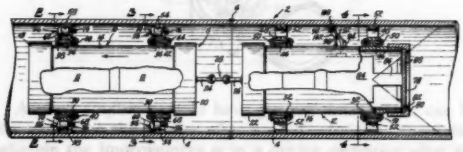
reduced to a very low temperature by dry ice, for example. The optical plug, which may be of optical glass, is sufficiently thick to serve as an insulator for preventing frosting of the outer face of the plug. The clamping action of a metal plate against the inner end of the plug with the interposed film prevents frosting in this region.

3,667,359

PHOTO INSPECTION POD ASSEMBLY FOR PIPELINES

Raymond K. Watts, and Walter Harry Chapman, both of El Paso, Tex., assignors to El Paso Natural Gas Company, El Paso, Tex.

Filed Nov. 25, 1969, Ser. No. 879,872
Int. Cl. G03b *37/00*
U.S. Cl. 95—11 HC 8 Claims



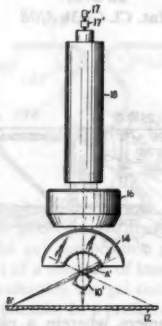
A self-contained inspection pod assembly for pipelines, propelled by gas pressure within the pipeline. The pod assembly has resilient cups thereon equipped with spring-loaded calibrated valves that stabilize travel speed, and contains rearwardly directed photographic camera means for periodically taking pictures of the pipeline's interior.

3,667,360

OPTICAL SCANNING SYSTEM

Frederick Vicik, Tuckahoe, N.Y., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,769
Int. Cl. G03b *37/02*
U.S. Cl. 95—12.5 6 Claims



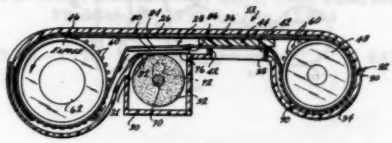
A real image of a point source of radiation is formed in space by a light beam modulated to convey information and reflected from a rotating prism. The rotation of the prism causes the image to move along a limacon curve. The moving image is reflected by a Mangin mirror and a second real image is formed on a photographic film strip. The second image remains in focus as it traverses a straight line on the film strip with a speed directly proportional to the tangent of the angle formed by the scanning beam by which the second image is formed with a line normal to the straight line traversed by the second image.

3,667,361

FILM DEVELOPING CAMERA

Daniel H. Meggs, Redondo Beach, and John W. Ryan, Los Angeles, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 8, 1969, Ser. No. 789,804
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 12 Claims



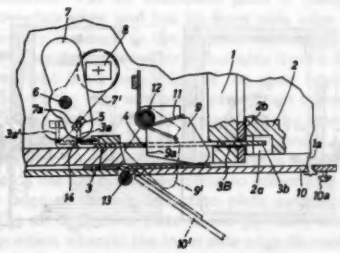
A simple camera and film cartridge which enables the film to be developed within the camera, comprising a length of film within the cartridge with its ends joined to form a loop. The film loop can be advanced in one direction to take successive pictures and then can be moved in the reverse direction for developing. At the beginning of reverse movement, the film removes a cover that separates it from a sponge that is saturated with a monobath developer/fixer solution, so that continuous turning of the loop develops the film which can then be removed from the cartridge.

3,667,362

PHOTOGRAPHIC APPARATUS WITH MEANS FOR ADJUSTING THE EXPOSURE CONTROL IN DEPENDENCY ON THE SENSITIVITY OF FILM

Karl Neudecker, and Anton Theer, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 25, 1970, Ser. No. 75,501
Claims priority, application Germany, Oct. 1, 1969, G 69 38 210.1
Int. Cl. G03b *17/18*
U.S. Cl. 95—31 FS 10 Claims



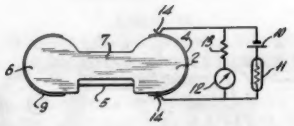
A photographic camera wherein the exposure control is automatically adjusted as a function of the speed of film in the inserted magazine. The camera has a door which opens automatically in response to unlocking and thereby disengages one or more scanning members from coding elements on the inserted magazine. The scanning member or members form part of one or more slides which are coupled to one or more adjustable parts of the exposure control and are biased in directions to move the scanning members into engagement with the corresponding coding elements. The door opening mechanism includes a strong spring which biases a lever against the door so that the lever tends to move the door toward its open position. The lever engages and retracts the slide or slides while it pivots in a direction to open the door.

3,667,363

FILM SENSITIVITY COMPENSATED LIGHT MEASURING NETWORK AND FILM MAGAZINE

Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1970, Ser. No. 80,703
Int. Cl. G03b *17/26*
U.S. Cl. 95—31 CA 5 Claims



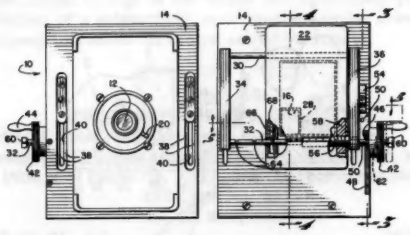
A camera includes a light responsive network having a pair of first and second terminals the resistance between which varies the network sensitivity and which are connected to first and second contact elements exposed in the camera film magazine chamber. A film magazine carries a resistor tape whose value corresponds to the film sensitivity and which is releasably engaged by the contact elements to correspondingly vary the network sensitivity. Alternatively, a plurality of spaced second contact elements are provided which are connected to the second network terminal through respective resistors and the film magazine carries a conductor tape of a shape and position in accordance with the film sensitivity and which engages predetermined second contact elements to provide a resistance between the network terminals to adjust its sensitivity in accordance with the film sensitivity. The resistor or conductor tape is the pressure sensitive tape securing the magazine cover.

3,667,364

CAMERA INCLUDING SEQUENTIAL EXPOSURE APPARATUS FOR A FILM PLATE

Arthur S. Mann, 1790 S. W. 23rd Avenue, Miami, Fla.

Filed Dec. 12, 1969, Ser. No. 884,682
Int. Cl. G03b *17/32*
U.S. Cl. 95—37 13 Claims



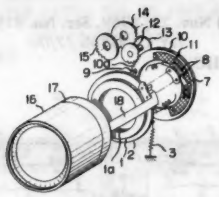
A camera including a fixed lens and aperture and means for sequentially moving a film plate past the lens sight line to present predetermined areas of the film plate for exposure each time the lens shutter is actuated. A secondary, simultaneous exposure system photographs and transmits identifying data, such as a number, to the predetermined film plate area. A rack and pinion assembly moves the film plate to selected positions for exposure of an area of the film plate and includes a numbered and lettered reference guide system. A pencil light beam apparatus allows proper alignment of the camera lens with the subject. Micrometer adjustment means are provided for the rack and pinion assembly. A master control switch is located in the secondary exposure system which prevents activation of the entire camera unless the identifying data is properly positioned.

3,667,365

DEVICE FOR COMPENSATING POSITIONAL DEVIATIONS USEFUL WITH INTERCHANGEABLE LENSES HAVING SCREW THREADS

Sakae Fujimoto, and Tadayuki Imai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 21, 1969, Ser. No. 809,286
Claims priority, application Japan, Mar. 25, 1968, 43/19337
Int. Cl. G03b *3/00*
U.S. Cl. 95—44 R 6 Claims



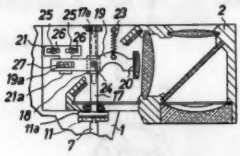
A device for compensating positional deviations in screwing interchangeable lenses into a single-lens reflex camera by means of an aperture setting ring including a pin mounted in a slot to determine its angular movement. A barrel lens has a hook element engagable with a notched area on the aperture setting ring. The hook element is mounted to have less angular movement than the aperture setting ring so that positive engagement is always provided within the range of movement of the barrel lens.

3,667,366

PHOTOGRAPHIC CAMERA WITH BUILT-IN RANGEFINDER

Dieter Engelsmann, Unterhaching; Dieter Maas, Munich; Rolf Schroder, Munich, and Gerda Linke, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 21, 1970, Ser. No. 39,306
Claims priority, application Germany, May 23, 1969, G 69 20 873.7
Int. Cl. G03b *3/08*
U.S. Cl. 95—44 C 9 Claims



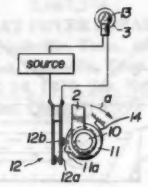
A photographic camera wherein a plastic camera body supports the metallic casing of a built-in rangefinder and a lens mount including a focussing ring whose rotation causes displacements of a movable optical element in the rangefinder casing by way of a gear train. A shaft of the gear train drives a rotary cam which displaces the movable optical element by way of one or more levers. Alternatively, the shaft of the gear train drives a threaded shaft which effects axial movements of a nut so that the latter pivots a lever which supports the movable optical element. The connection between the shaft of the gear train and the cam or nut is such that the shaft can move radially to compensate for eventual displacements of the lens mount with reference to the casing of the rangefinder.

3,667,367

SHUTTER RELEASE TIME PRELIMINARY INDICATION DEVICE FOR A PHOTOGRAPHIC CAMERA HAVING A BUILT-IN SELF-TIMER

Fumihiro Miyagawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 27, 1970, Ser. No. 58,414
Claims priority, application Japan, Aug. 21, 1969, 44/79663
Int. Cl. G03b *17/38*
U.S. Cl. 95—53.3 **4 Claims**



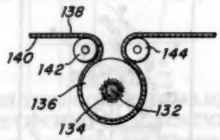
A photographic camera having a self-timer which can be set to release the shutter after a predetermined time delay, wherein the improvement is in a device operative after the setting of the self-timer to indicate when the shutter is about to be released. A level connected to the self-timer shaft trips a switch a few seconds before the shutter is released and turns on a lamp visible from the front of the camera. The lamp indicates that the shutter is about to be released and serves to alert the persons who are about to be photographed.

3,667,368

GEL ROLLER FOR USE IN PHOTOGRAPHIC PROCESSING

Alvin Cronig, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Original application Sept. 3, 1968, Ser. No. 756,797, now Patent No. 3,574,618. Divided and this application Dec. 10, 1970, Ser. No. 96,710
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 A **2 Claims**



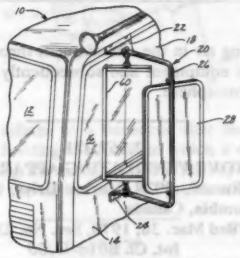
Improved photographic gel processes, apparatus, and compositions wherein the photographic materials are carried in a gel composition. The gel composition preferably comprises the reaction product of a solution of image forming materials and a gel former. Preferably the gel composition structure is heat-reversible and flexible. In a preferred method of this invention, a photosensitive copy medium is exposed and contacted with a gel composition comprising a reaction product of a solution of image forming materials and a gel former. The gel composition is allowed to remain in contact with photosensitive material for a sufficient time to process the exposed photosensitive material. The gel composition is cooled during the processing in order to form a layer which is strippable from the photosensitive material. In one embodiment of this invention, the gel composition is in the liquid or viscous state when it is contacted with the photo sensitive layer. The gel composition also may be in the form of a tape, gel roller, or the like when it is brought into contact with the photosensitive layer. Another preferred embodiment of this invention is where the gel composition is heat reversible and therefore, can be heated after use to convert to a liquid or viscous state and can then be reused in the system which requires a liquid or viscous gel composition for the starting material. A gel comprising a solution of metal ions or physical developer is an especially preferred system.

3,667,369

AIR DEFLECTION PLATE FOR A VEHICLE

Donald D. Smith, 3117 Homeway Drive, Cedar Falls, Iowa

Filed Feb. 19, 1970, Ser. No. 12,594
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.12 **4 Claims**



An air deflection plate for use with a vehicle having a door with a vent window and a door window positioned therebehind. Upper and lower support members are secured to the vehicle door adjacent the upper and lower ends of the vent window. A U-shaped support extends outwardly from the support members and has a rear view mirror operatively secured thereto. The deflection plate is frictionally pivotally secured at its upper end to the upper support member and is frictionally pivotally secured at its lower end to the lower support member. The air deflection plate is comprised of clear safety plate glass and has an inner side edge which is complementary in shape to the exterior surface of the vent window. The air deflection plate is movable from a first position wherein the inner side edge of the plate is positioned closely adjacent the vent window to prevent air currents from passing between the air deflection plate and the vent window so that the air currents are deflected outwardly and rearwardly therefrom. A resilient molding strip is secured to the inner edge of the air deflection plate to effectively seal the inner side edge of the air deflection plate against the vent window. The air deflection plate is also pivotally movable to a second position wherein the inner side edge thereof is positioned forwardly and outwardly of the trailing edge thereof so that air currents may be deflected into the vehicle cab through the door window when the door window is lowered or opened.

3,667,370

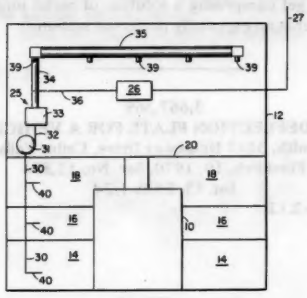
NUCLEAR CONTAINMENT EMERGENCY VENTILATING SYSTEM

John H. Noble, Wellesley Hills, Mass., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jan. 13, 1970, Ser. No. 2,531
Int. Cl. F24f *11/02*
U.S. Cl. 98—33 R **16 Claims**

An emergency air mixing and venting system within the containment structure of a nuclear power reactor contain-

ment system mixes gases and vapors contaminated with radioactivity with air contained in the containment structure



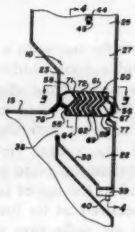
prior to passing air in the containment through conventional gas treatment equipment and subsequently discharging it to the outside atmosphere.

3,667,371

STOVE VENTILATING APPARATUS

Kenneth S. Russell, 3928 Marine Drive, West Vancouver, British Columbia, Canada

Filed Mar. 30, 1970, Ser. No. 23,538
Int. Cl. B01d *45/00*
U.S. Cl. 98—115 K **1 Claim**



Ventilating apparatus for cooking stoves and other appliances using hot oils and fats and including a duct having an entrance through which grease-laden air enters the duct. A cartridge positioned within the duct is reversible between two operative positions. This cartridge has a passage therethrough in which baffle means is located for causing grease to be deposited in the cartridge, the baffle means being such that it works effectively regardless of which of the two operative positions the cartridge is in. A spray is located above the cartridge to wash the grease off the baffle means and into a trough located beneath the cartridge.

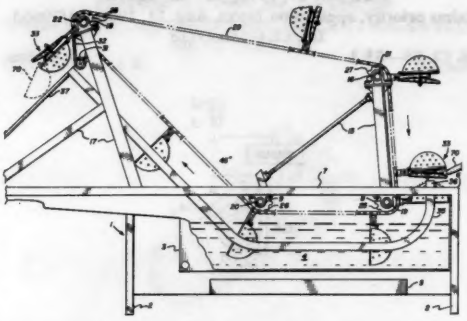
3,667,372

FOOD COOKING APPARATUS

Arthur L. Hilvitz; Philip E. Hilvitz; Harvey M. Hilvitz, and Richard Campbell, all of Pueblo, Colo., assignors to La Tolteca Foods, Inc., Pueblo, Colo.

Filed Nov. 13, 1969, Ser. No. 876,429
Int. Cl. A47j *37/12*
U.S. Cl. 99—404 **19 Claims**

There is disclosed a food cooking apparatus having a conveyor positioned over a cooking vessel. The cooking vessel is filled with frying fat and means are provided for heating the fat to a predetermined temperature. A plurality of normally open food molds are mounted on the conveyor. Uncooked tortilla cakes are loaded into the normally open molds and the conveyor operates to move each loaded food mold into engagement with guides which define a path through the cooking vessel. The guides operate to fold the loaded food molds into a closed position, thereby to form a U-shaped tortilla. Means are also disclosed on each mold to prevent the accidental opening of the mold while it is in the guides. Pusher means are further included in each food mold for automatically discharging cooked tortillas onto a tray.

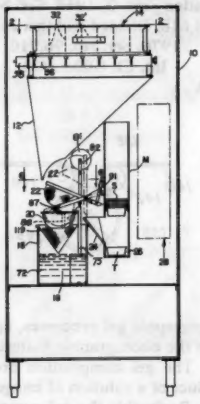


3,667,373

AUTOMATIC MACHINE FOR VENDING FRIED FOODS

Frederic A. Sicher, Glen Ellyn, and Joseph Gaysowski, Westchester, both of Ill., assignors to said Sicher, by said Gaysowski

Filed June 8, 1970, Ser. No. 44,232
Int. Cl. A47j *37/12*
U.S. Cl. 99—407 **19 Claims**



A fried potato vending machine characterized by an upright cabinet having mounted therein a support for a removable multiple bin supply tray adapted to have each bin filled with a predetermined quantity of raw or partially cooked potatoes and a mechanism for feeding the batches of potatoes from successive bins to a hopper which empties into a cooking bowl pivotally mounted above a storage vessel in which a supply of cooking oil is maintained at predetermined temperature by an immersion heater and means for transferring a quantity of the hot cooking oil to the cooking bowl in which successive batches of potatoes are cooked and when cooking is completed, the cooked potatoes are dumped into a serving tray fed from a supply stack, the cooking bowl

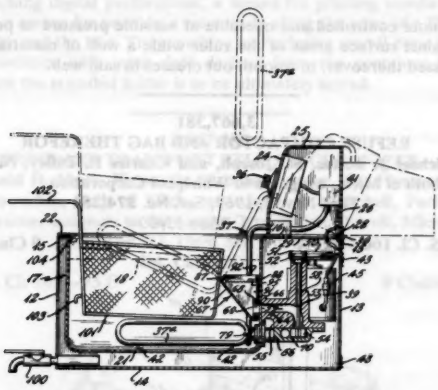
being pivoted, when cooking of each batch is completed, to dump the oil through a removable and replaceable filter member into the storage vessel. Electrical operating and control circuitry, which is actuated by deposit of a coin, includes drive motors and timed switches for operating the feeding and handling mechanisms and provides for heating the oil, the electrical requirements being such that the machine can be operated when supplied with current from a conventional 110–115 Volt current supply line.

3,667,374

DEEP FAT FRYER APPARATUS

Brandon M. Holmes, Nashville, Tenn., assignor to Progressive Products Corporation, Nashville, Tenn.

Filed Oct. 14, 1970, Ser. No. 80,736
Int. Cl. A47j *37/12*
U.S. Cl. 99—408 **6 Claims**



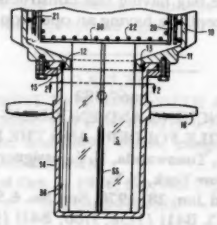
A deep fat fryer having a pump for circulating cooking fluid or oil in a cooking receptacle and a filter for removing foreign substances from the cooking oil. Cooking fluid circulated through the receptacle flow over the heating elements and sweeps along foreign particles in the fluid which are removed by a filter interposed in the flow path of the cooking fluid.

3,667,375

MEANS FOR MELTING CONGEALED LIQUID AND FOR PREVENTING CONGELATION

Eugene A. Pottinger, Louisville, and Winston L. Shelton, Jeffersontown, both of Ky., assignors to Commercial Appliances, Inc.

Filed Feb. 24, 1971, Ser. No. 118,283
Int. Cl. A47j *37/12*
U.S. Cl. 99—408 **2 Claims**



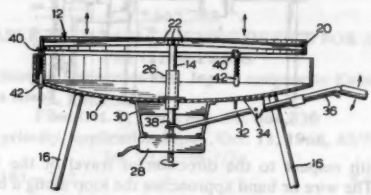
A heat-conductive member having an upper portion in contact with a bath of hot cooking liquid is detachably mounted in a collector unit of a pressure cooking vessel and by its presence serves to melt congealed liquid in said unit and without interference with the normal functioning of the cooking operation.

3,667,376

BARBECUE

Orla D. Thompson, 40 Owen Boulevard, Willowdale, Ontario, Canada

Filed July 11, 1969, Ser. No. 841,020
Int. Cl. A47j *37/07*
U.S. Cl. 99—443 R **6 Claims**



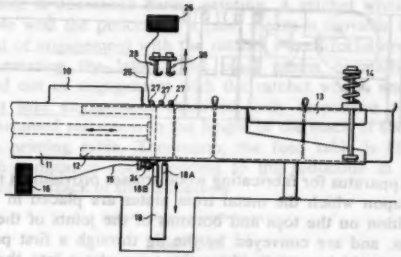
This invention relates to a barbecue that has a rotatably mounted grill for holding the foods in which a device is provided for preventing the travel of liquid fat beyond the outer peripheral edge of the barbecue as the grill is rotated.

3,667,377

TYING MECHANISM FOR BALES

Bengt Ake Persson, Traktorgatan, Sweden, assignor to Personer AB, Ystad, Sweden

Filed Mar. 15, 1971, Ser. No. 124,407
Int. Cl. B65b *13/28*
U.S. Cl. 100—19 **3 Claims**



A bale tying mechanism in a bale press comprises a reciprocable forked needle which forms against three spaced intercepting members two standing wire loops in the spaces between the intercepting members. The intermediate intercepting member has co-operating cutting members for severing the wire forming the loops where such wire engages the intermediate intercepting member.

3,667,378

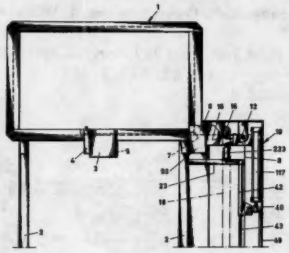
WIRE OR BAND STRAPPING MACHINE

Pieter Arnoldus Van de Bilt, Zeist, Netherlands, assignor to N. V. Metaverpa

Filed Dec. 7, 1970, Ser. No. 95,687
Claims priority, application Netherlands, Dec. 10, 1969, 6918527
Int. Cl. B65b *13/10*
U.S. Cl. 100—26 **2 Claims**

A wire or band strapping machine comprises a driven roll pair for feeding a wire or band toward a guide loop about an object to be strapped, a driven roll pair for reversing the

direction of movement of the wire or band to draw the same out of the guide and about the object, and tension means for tightening the wire or band in that reversed direction. The tension means is disposed between the two roll pairs, with the feeding pair disposed closer to the loop than the reversing



pair with respect to the direction of travel of the wire or band. The wire or band approaches the loop along a horizontal U-shaped path with the feeding and reversing roll pairs operating on the upper and lower horizontal legs of that path, respectively, and the tensioning means acting downwardly on the wire or band in the bend of its U-shaped path.

3,667,379

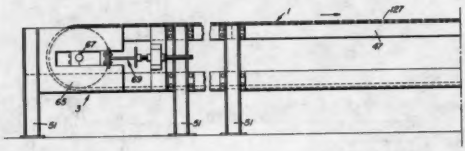
APPARATUS FOR PREFABRICATING WOOD STRUCTURES

Gail H. Templin, Vero Beach, Fla., assignor to Templin Associates, Inc., Vero Beach, Fla.

Filed Jan. 11, 1971, Ser. No. 105,253

Int. Cl. B30b *7/00*

U.S. Cl. 100—139 **15 Claims**



Apparatus for fabricating wood trusses providing a moving jig upon which the metal truss plates are placed in proper position on the tops and bottoms of the joints of the wood truss, and are conveyed by the jig through a first pressure means which partially drive the truss plates into the wood truss at the joints thereof, only forcing penetration sufficient to hold the plates in proper position. A set of pressure rollers through which the truss, with the truss plates partially inserted in the truss, passes for forcing the truss plates into the wood truss into their final joint holding positions. The jib is provided with means for properly positioning the properly maintaining the truss thereon, certain of which are automatically disengaged when the means is reached.

3,667,380

SMOOTHING RULER FOR PAPER GLAZING CALENDERS

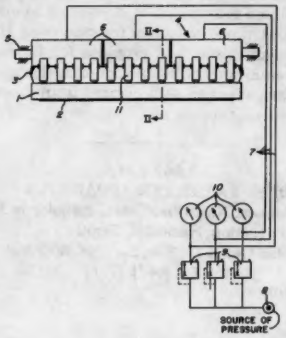
Jurgen Schlunke, and Dieter Junk, both of Krefeld, Germany, assignors to Joh. Kleinewefers Sohne Maschinenfabrik, Krefeld, Germany

Filed Sept. 3, 1970, Ser. No. 69,405

Int. Cl. B30b *3/04*

U.S. Cl. 100—161 **7 Claims**

For use in connection with a paper glazing calender, a smoothing ruler the position of which is adjustable by a plurality of pressure members which are vertically movable on a support beam that is pivotally connected to said ruler, said pressure members forming fluid operable plungers which are



remote controlled and operable at variable pressure to press against surface areas of the ruler while a web of material is passed thereover, to smooth out creases in said web.

3,667,381

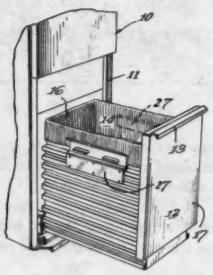
REFUSE COMPACTOR AND BAG THEREFOR

Michael J. Bottas, St. Joseph, and Charles R. Difley, Niles, both of Mich., assignors to Whirlpool Corporation

Filed Nov. 5, 1969, Ser. No. 874,251

Int. Cl. B30b *15/00*

U.S. Cl. 100—229 A **8 Claims**



A refuse receiver in a refuse compactor comprising a receptacle having an open top bounded by peripheral edge portions, a refuse holding bag in the receptacle having a double cuff formed by a pair of successive outward folds of the edge of the bag with opposite edge portions of the bag each having a single slit that facilitates folding of the bag sides in the pair of successive outward folds to form the double cuff and with the single slits facilitating the folding without excessive danger of refuse spillage through the bag sides at the slits during removal of a filled bag from the compactor. A refuse holding disposable bag having this construction for positioning in a refuse receptacle having an open top in which refuse is compacted.

3,667,382

PRINTING PUNCHING AND ENCODING APPARATUS FOR FILE FOLDERS AND THE LIKE

Robert P. Kaplan, Tonawanda, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

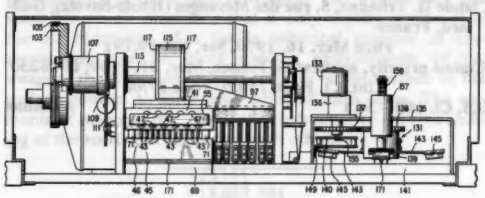
Filed Jan. 28, 1970, Ser. No. 6,517

Int. Cl. B41j *11/58, 1/00*; B41l *19/04*

U.S. Cl. 101—19 **9 Claims**

This disclosure describes an apparatus for encoding file folders and the like, said file folders having corresponding

file folder containers in which the file folders are to be stored. The file folders are coded along one edge with perforated digital information, alpha numeric information and color code information by the apparatus of the invention. More specifically, the apparatus includes a means for



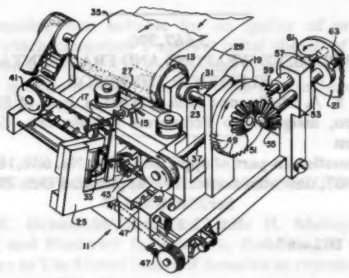
punching digital perforations, a means for printing numbers and a means for printing a color code along the edge of a file folder and the like. The punching and printing are all done in accordance with input data derived from the container in which the encoded folder is to be ultimately stored.

3,667,383

PRINT AND TRANSPORT BELT SYNCHRONIZER

Ronald H. Mack, Plymouth; Nicholas Kondur, Jr., Plymouth Township, both of Mich., and James A. Mitchell, Paris, France, assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1969, Ser. No. 887,605
Int. Cl. B41j *5/00*
U.S. Cl. 101—93 C **9 Claims**



A high-speed serial printer including a continuously rotating print drum having characters on its periphery, a hammer and carrier, and a belt for transporting the hammer and carrier parallel to the axis of drum along a line of print. A control system, including two timing discs, operates in synchronism with the drum. The first disc is indicative of the angular position of the drum and the second disc is to signal the hammer carrier to engage the transport belt at the start of each line of print. A double-ended transducer responds to the two timing discs to provide the appropriate signals for the printer.

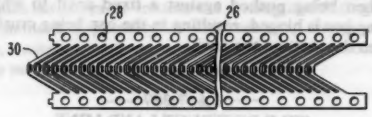
3,667,384

SLOTTED PRINT TYPE BELT WITH ANGULARLY DISPOSED TYPE MOUNTING STRIPS

Albert Sniderman, Southfield, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 1, 1970, Ser. No. 77,183
Int. Cl. B41j *1/20*
U.S. Cl. 101—111 **5 Claims**

A print type belt provides a flexible band that is slotted to form a plurality of angular mounting strips extending across the band, and a like number of type members removably attached to the strips at their centrally located apexes, the arms of the strips acting to resiliently support the type members



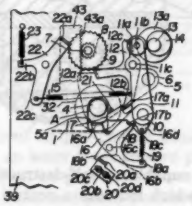
and to maintain their alignment with a print line during a printing operation.

3,667,385

PAPER FEED TABLE LIFTING DEVICE FOR A PRINTING PRESS

Minoru Suzuki, Kanagawa-ken, Japan, assignor to Kabushiki-Kaisha Ricoh, Tokyo, Japan

Filed Oct. 8, 1969, Ser. No. 864,830
Claims priority, application Japan, Oct. 11, 1968, 43/74443
Int. Cl. B65h *1/14*
U.S. Cl. 101—232 **5 Claims**



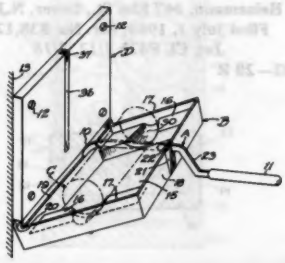
A lifting device for a paper feed table for a printing press which operates to lift a table, by rotation of a pinion meshing with a rack connected to the table and disposed substantially vertically, when the height of a stack of printing sheets on the feed table is decreased during printing. A ratchet wheel is rotatable with the pinion and a pawl means is movable into and out of engagement with the ratchet wheel, for intermittently rotating the latter. The pawl means normally is retained out of engagement with the ratchet wheel, and is brought into engagement therewith only responsive to a predetermined reduction in the height of the stack of sheets on the printing table. Thereupon, the feed table is lifted through a distance corresponding to the reduction in the height of the stack of sheets thereon.

3,667,386

CAN CRUSHER

Grandell H. Workman, 1845 Federal Ave., Los Angeles, Calif.

Filed May 7, 1971, Ser. No. 141,232
Int. Cl. B30b *7/00*
U.S. Cl. 100—233 **8 Claims**



An apparatus for two-stage crushing of a can, the center of the can being first collapsed by a lever finger while the ends

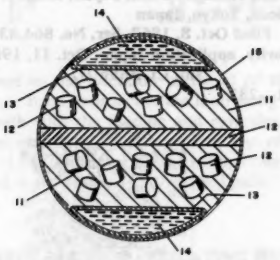
of the can are supported on shoulders at the sides of a swinging jaw on which the lever is fulcrumed, the ends of the can being tilted inwardly by such central collapse, and the tilted ends then being pushed against a fixed anvil to which the swinging jaw is hinged, resulting in the can being crushed flat between the jaw and the anvil.

3,667,387

SELF-DESTRUCT LAND MINE

Jean P. Picard, Morristown; Thomas E. Dunigan, Oak Ridge, and Lawrence W. Pell, West Orange, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 19, 1971, Ser. No. 107,766
Int. Cl. F42b *23/00*
U.S. Cl. 102—8 **7 Claims**



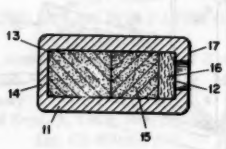
A land mine capable of self-destructions after a selected period of time which includes a central portion of a friction sensitive material capable of supporting self combustion. A layer of white phosphorus disposed so as to surround and directly contact said friction material and having embedded therein a plurality of explosive pellets. One or more thin wall, frangible, glass vials containing a vaporizable solvent, abutting at least a portion of said white phosphorus and facing outwardly thereof. The entire structure being coated with an elastic material which is soluble under the action of said solvent. There is specifically disclosed the use of acetone in conjunction with a nitrocellulose coating and a generally spherical configuration. The mine being capable of initial activation by pressure applied thereto, which, ignites the frictional material and in turn the phosphorus. The ignited phosphorus detonates the explosive pellets. The self-destruct operation commences when the mine is dropped, as for example, from an airplane, and the glass vial is broken thus releasing the solvent which starts the dissolution of the nitrocellulose outer film. When dissolved the phosphorus is exposed to the atmosphere and self destruction is initiated thus providing in addition, a visual indication of activation and self-destruction.

3,667,388

EXPLOSIVE INITIATING DEVICES

Robert W. Heinemann, 147 Elm St., Dover, N.J.

Filed July 1, 1969, Ser. No. 838,120
Int. Cl. F42b *3/12, 3/18*
U.S. Cl. 102—28 R **2 Claims**



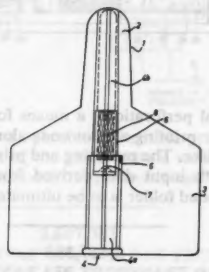
Explosive initiating devices constructed to permit a volatile liquid to penetrate into the housing, thereby saturating the explosive to prevent inadvertent initiation of the devices. Subsequent evaporation of the liquid from the explosive, over a predetermined interval of time, arms the devices.

3,667,389

SKEET SHOOTING ARRANGEMENT

Claude H. Tritenne, 5, rue des Mesanges (Haute-Savoie), Gaillard, France

Filed Mar. 16, 1970, Ser. No. 19,791
Claims priority, application France, Mar. 21, 1969, 6908230
Int. Cl. F42b *15/00*; F41e *27/06*
U.S. Cl. 102—34.1 **4 Claims**



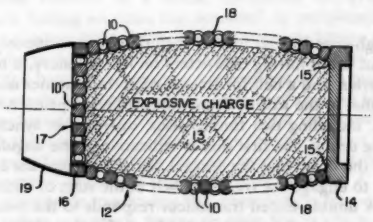
A skeet shooting assembly wherein the skeet has a hollow central channel with a cartridge therein. The ignition of the cartridge charge is accomplished by means of a fuse fired by an elongated fuse firing element, preferably of pistol-type which penetrates the central channel and engages the cartridge.

3,667,390

EXPLOSIVE WEAPONS AND FRAGMENTARY ELEMENTS THEREFOR

Gunnar F. A. Medin, and Erik G. Olsson, both of Eskilstuna, Sweden, assignors to Forsvarets Fabriksverk, Eskilstuna, Sweden

Continuation-in-part of application Ser. No. 686,189, Nov. 28, 1967, now abandoned. This application Oct. 29, 1969, Ser. No. 872,153
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 **7 Claims**



An explosive weapon and a fragmentary element therefor are disclosed. The explosive weapon comprises an explosive charge and a means to combine a plurality of fragmentary elements with the explosive charge to form an explosive assembly. Each of the fragmentary elements comprises a member having the general shape of a sphere. Each of the members has six flat surfaces located along the greatest diameter of the sphere. This greatest diameter occurs along the great circle or equatorial zone of the spherically shaped member. Each of the flat surfaces intersects the next adjacent flat surface at the greatest diameter of the sphere.

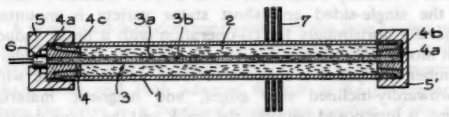
Therefore, a cross section through the element in a plane including the greatest diameter and the center of the sphere has a regular hexagonal shape. The flat surfaces are adjacent elements adapted to be facially disposed to prevent rotation of the elements with respect to each other. These flat surfaces are further adapted to join other flat surfaces located in the structure of the explosive weapon. The fragmentary element has an air resistance that is only slightly greater than the air resistance of a totally spherical member of corresponding size. In more specific embodiments of the weapon, the fragmentary elements are in flat surface to flat surface contact to form rows adjacent each other. The elements of adjacent rows interlock each other to prevent shifting of the rows with respect to each other.

3,667,391

DETONATOR AND IGNITER FOR EXPLOSIVES

Rene' Amiable, Sevran; Jean-Noel Lhuillier, Vert-le-Petit, and Paul Benkheiri, Sevran, all of France, assignors to Etat Francais represente par Le Ministre des Armees, Delegation Ministerielle pour L'Armement (Direction Des Poudres), Paris, France

Filed May 1, 1969, Ser. No. 820,902
Claims priority, application France, May 17, 1968, 68152245
Int. Cl. F42c *19/08*
U.S. Cl. 102—70 **2 Claims**



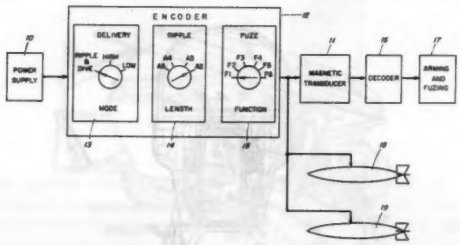
A detonating fuse suitable for an igniter of propelling charges, which comprises a narrow metal sheath of lead or tin containing a mixture of a secondary explosive with a non-explosive ignition-booster. The invention also includes an igniter containing the detonating fuse.

3,667,392

ORDNANCE FUZE ENCODING AND DECODING SYSTEM

Rodney E. Grantham, Bethesda; John H. Malloy, Silver Spring, and Frederick E. Warnock, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 6, 1970, Ser. No. 25,942
Int. Cl. F42c *13/00, 15/24, 11/02*
U.S. Cl. 102—70.2 R **12 Claims**



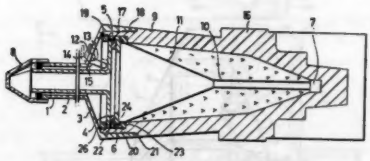
An ordnance fuze system includes a source of D.C. voltages and an encoder located on an ordnance delivery vehicle, such as an aircraft, and a magnetic transducer, decoder, and arming and fuzing circuit located on an ordnance device, such as a bomb. A ternary voltage code is encoded on the aircraft to select the delivery mode, arming time, and fuze options of the bomb. The coded signal is transferred to the bomb at aircraft-bomb separation via the transducer and decoded in the decoder, which includes a plurality of SCR's and switch actuators, to initiate the arming and fuzing circuit which includes a plurality of fuze sensors, energy storage devices, switches, and an arming motor. The encoder includes a mechanically initiated ripple option.

3,667,393

ELECTRIC FUZE FOR SHAPED-CHARGE MISSILES

Lars Bertil Aronsson; Anders Bertil Arnell, both of Eskilstuna, and Ulf W. Molitor, Torshalla, all of Sweden, assignors to Forsvarets Fabriksverke, Eskilstuna, Sweden

Continuation-in-part of application Ser. No. 686,068, Nov. 28, 1967. This application July 24, 1969, Ser. No. 844,554
Int. Cl. F42c *13/00*
U.S. Cl. 102—70.2 **1 Claim**



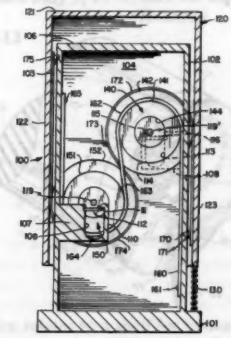
An electric fuze for a shaped-charge missile, said missile having an outer and an inner front closure plate, said plates being spaced apart by an air gap, a tubular stand-off member projecting forwardly from said front closure plates and comprising an outer and an inner tube spaced by an air gap, said tubes being mechanically and electrically connected to different ones of said outer and inner front closure plates, a piezoelectric crystal element being located behind said front closure plates and connected in a circuit comprising an electric fuze, said front closure plates, said tubes and said air gaps, so that initiation of the fuze occurs when the front portion of the missile is deformed and one or both of said air gaps is short-circuited and said piezoelectric crystal generates an electric pulse.

3,667,394

ROLAMITE SAFETY AND ARMING MECHANISM

David W. Lewis, Charlottesville, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 21, 1971, Ser. No. 108,540
Int. Cl. F42c *15/24*
U.S. Cl. 102—78 **11 Claims**



An inertial operated fuzing and arming mechanism having two telescoping encasing members and a pair of rollers held within said encasing members and a pair of rollers held

within said encasing members by a plurality of S-shaped flexible bands, each band engaging different diameter portions of the rollers and the ends of the bands being attached to the inside of said encasing members. A detonator and explosive are associated with one of said encasing members and one of the rollers and the other encasing member has an aperture therein so that when said two encasing members and said roller are aligned, the fuze is activated to detonate the explosive.

3,667,395

DUMMY SHELL

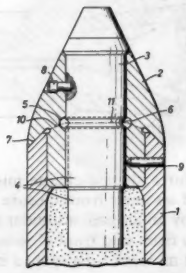
Rudolf Romer, and Heinz Hap, both of Dusseldorf, Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed May 26, 1969, Ser. No. 827,727

Claims priority, application Germany, June 1, 1968, P 17 03 518.6

Int. Cl. F42b *5/22*

U.S. Cl. 102—92.7 **3 Claims**



A dummy shell with a screwed-in impact-ignition-and-decomposition device which comprises means for weakening the cross-section of the head of the shell at a set breaking point within the range of the connecting plane between the impact-ignition device and the decomposition device. By this arrangement it is brought about that upon inclined or flat impact of the shell, the impact-ignition-device separates itself from the decomposition device, and the latter remains in the jacket of the shell.

3,667,396

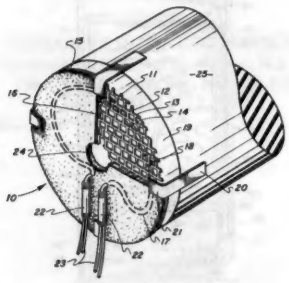
SOLID PROPELLANT GRAIN IGNITER

Donald H. Barrett, Waco, Tex., assignor to North American Rockwell Corporation

Filed Apr. 2, 1969, Ser. No. 812,935

Int. Cl. F42b *1/00*

U.S. Cl. 102—101 **8 Claims**



An igniter for a solid propellant grain having a perforated sheet substrate, which serves as a support structure for a flexible pyrotechnic coating applied to either one side or both sides of the sheet and extending into the interstices of the sheet, and an igniter cord attached to the sheet in which said cord contains a detonating-igniting composition which when initiated by a squib produces hot particles to penetrate the sheet interstices and ignite the coating.

3,667,397

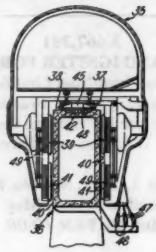
LINEAR INDUCTION MOTOR SECONDARY MEMBER

Richard Humphrey Haynes, Hemingford Grey, England, assignor to Tracked Hovercraft Limited, London, England

Filed June 25, 1971, Ser. No. 156,624

Int. Cl. H02k *41/04*

U.S. Cl. 104—148 LM **14 Claims**



The secondary member in or for a linear induction motor of the single-sided and short stator variety is mounted generally horizontally for co-operation with a linear induction motor primary member carried above it. The secondary member comprises a rolled aluminum reaction plate with downwardly-inclined side edges, and magnetic material which is interposed between the track and the plane central part of the reaction plate. The reaction plate extends beyond the magnetic material along either side, and supports are provided for supporting the overhanging portions from the track inwardly of the downwardly-inclined parts. The reaction plate is secured in position by members which are attached to the track along either side of the secondary member and which abut the upper surfaces of the downwardly-inclined parts of the reaction plate.

3,667,398

LINEAR INDUCTION MOTOR SECONDARY MEMBER

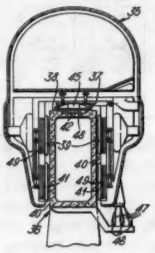
Christopher Durrant English, Burwell, England, assignor to Tracked Hovercraft Limited, London, England

Filed June 25, 1971, Ser. No. 156,625

Claims priority, application Great Britain, June 26, 1970, 31,143/70

Int. Cl. H02k *41/04*

U.S. Cl. 104—148 LM **14 Claims**



The secondary member in or for a linear induction motor of the single-sided and short stator variety is mounted generally horizontally for co-operation with a linear induction motor primary member carried above it. The secondary

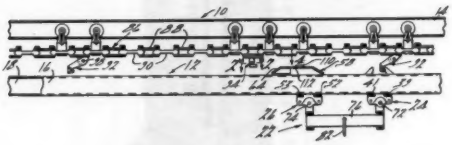
member comprises an aluminum reaction plate disposed above magnetic material which supports it from the track. The reaction plate is wider than the magnetic material and extends beyond it along either side of the secondary member at side portions which in operation provide the longitudinally extending parts of the current paths in the reaction plate. The reaction plate is clamped down on to the track by clamping devices which produce clamping forces on the undersides of the side portions immediately adjacent the magnetic material.

3,667,399

POWER AND FREE CONVEYOR SYSTEM

Adolph Czarnecki, Birmingham, Mich., assignor to Standard Alliance Industries, Inc., Chicago, Ill.

Filed Sept. 3, 1969, Ser. No. 854,817
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 S **7 Claims**



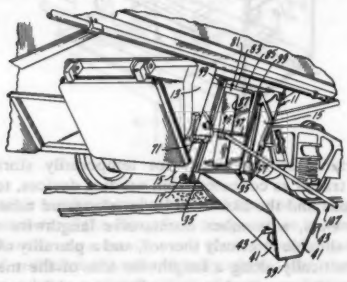
A power-and-free conveyor system of the type having work carriers each consisting of coupled front and rear trolleys adapted to be propelled along a track by lugs on an overhead chain drive and each adapted further to be disconnected from the drive in a localized close pack section of the conveyor by a cam plate on the rear trolley of the preceding carrier, and wherein the drive and the cam plate of each carrier have novel means which are uniquely cooperative to prevent the carrier from back-sliding on inclined portions of the track in the event the front trolley thereof inadvertently becomes uncoupled from the drive and also to more effectively and efficiently transfer the carrier through a switch point from one conveyor to another or from a conveyor onto a spur track for storage or the like.

3,667,400

RAILWAY BALLAST DISTRIBUTING CAR DOOR ASSEMBLY

Sergio Rene Damy, Apartado Postal "A" 2041, Guadalajara, Jalisco, Mexico

Filed Nov. 3, 1970, Ser. No. 86,486
Int. Cl. B61d *7/18*, *7/26*; F07f *5/27*
U.S. Cl. 105—239 **4 Claims**



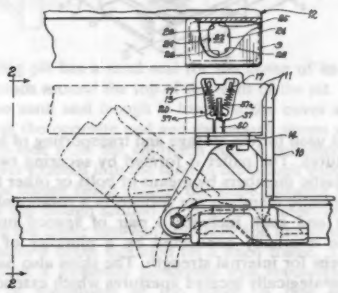
A terracing door assembly for a railway hopper car having an outer door which also functions as a chute and an inner ballast flow control door. A mechanism is provided to lock the outer door in its closed position and also in several lowered and open positions. The inner ballast flow control door may be opened to a variety of positions ranging from fully closed to fully opened and may be locked in these positions by means of a sliding locking bar whose ends ride in guides located on opposite sides of the ballast discharge opening. A tool is provided for opening and closing the inner ballast flow control door.

3,667,401

CONTAINER RETAINING LATCH MECHANISM

Phillip D. Schwiebert, Glencoe, and Edward S. Steck, Chicago, both of Ill., assignors to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed Feb. 14, 1969, Ser. No. 799,400
Int. Cl. B65j *1/22*; B60p *7/08*
U.S. Cl. 105—366 D **11 Claims**



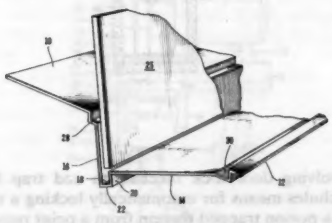
A latch mechanism including a pivotable clasp biased for engagement with a catch opening in a container part. The clasp has a head portion with a cam surface of steep incline and a detent surface of slight incline, with respect to the plane of a catch support having an opening through which the clasp extends, whereby bias is easily overcome through engagement of the detent surface for latching engagement, and retention force is large, as a result of the steep angle of the cam surface. Space for lateral play of the clasp element in its receiving opening of the container, together with wedge sides of the clasp and rounded surfaces of the catch opening compensate for off-center variations therebetween upon initial container seating. Bias springs acting upon the clasp form the arms of a lateral "Y" configuration, respectively, to balance, center and stabilize the clasp upon final container seating.

3,667,402

SHELF FOR BOOKS

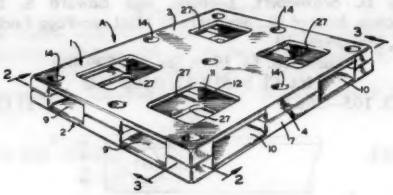
Kent M. Graves, 71 West Ave., Apt. #12, Brockport, N.Y.

Filed May 3, 1971, Ser. No. 139,586
Int. Cl. A47b *85/00*
U.S. Cl. 108—12 **2 Claims**



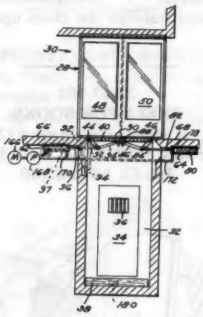
The invention relates to a shelf for books or the like having an insert which allows the shelf to be easily converted for use with either normal or conventional sized books in one instance or smaller books such as paperbacks in another instance.

3,667,403
PALLET
John A. Angelbeck, Jr., Chesterfield, Mo., assignor to Pack-Rite Packaging & Crating Co., Inc.
Filed June 11, 1970, Ser. No. 45,511
Int. Cl. B65d *19/18*
U.S. Cl. 108—58 10 Claims



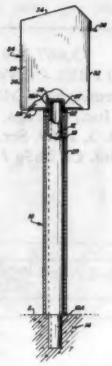
A pallet used for the storage and transporting of load bearing structures. The pallet is formed by securing two mating unitary plastic members by means of bolts or other fasteners. The two plastic members are formed in a rotational molding operation and each includes a pair of spaced outer skins which are internally connected by a plurality of properly spaced webs for internal strength. The skins also have a plurality of strategically located apertures which extend through each of the skins.

3,667,404
REVOLVING DOOR LOCK MECHANISM AND TRAP FLOOR ASSEMBLY
Ernest Foster, 4793 Concord Avenue, Detroit, Mich.
Filed Jan. 18, 1971, Ser. No. 107,096
Int. Cl. E05g *3/00*
U.S. Cl. 109—8 8 Claims



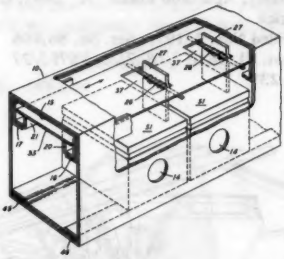
The revolving door lock mechanism and trap floor assembly includes means for automatically locking a revolving door with a person trapped therein from a point remote from the door. A trap floor is provided beneath the door assembly. A room is provided beneath the trap door for incarcerating a person. The trap floor includes means for automatically opening thereof when a person is standing thereon and, subsequently, for automatically closing the floor after the person has fallen into the room beneath the trap floor.

3,667,405
VANDAL RESISTIVE POST
Albert F. Roach, Jr., 8325 Ohio River Boulevard, Pittsburgh, Pa.
Filed Oct. 29, 1970, Ser. No. 85,113
Int. Cl. E05g *1/04*; E04h *12/18*
U.S. Cl. 109—51 10 Claims



A compound post for supporting publicly used parking meters, fine boxes, vending machines, money changers, and other related publicly used facilities, the post being so designed as to prevent the vandalism and/or theft of the supported facility, and wherein the compound post includes an upright pipe having its lower end ground secured, the facility mounted for rotation about the axis of the pipe at its upper end, and at least one other pipe telescoped over the upright pipe for free rotation thereon to resist the action of a cutting tool applied thereto, the other pipe extending substantially the entire distance between said facility and the ground.

3,667,406
PORTABLE SECURITY VAULT
Frank Joseph Shea, 258 East Shore Trail, Sparta, N.J.
Filed Sept. 2, 1970, Ser. No. 68,813
Int. Cl. E05g *1/00*
U.S. Cl. 109—57 34 Claims



A portable security vault for temporarily storing coin boxes in transit as collected from vending devices, telephone pay stations and the like includes an elongated tube open at opposite ends, a member coextensive lengthwise with the tube and slidable interiorly thereof, and a plurality of paddles spaced vertically along a lengthwise axis of the member to provide tandem spaces between adjacent paddles to store the respective coin boxes therein. The paddles are restricted to rotation in a given direction from normal perpendicular positions to permit the insertion of coin boxes into the spaces at a tube predetermined end and the ejection of the stored coin

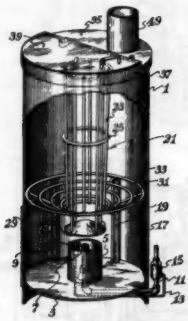
boxes at the tube opposite end, the latter being responsive to repetitive insertion and withdrawal movements of the slidable member thereat. An arrangement for locking the paddle member to the vault structure precludes unauthorized retrieval of the stored coin boxes at the tube predetermined end. The tube ends may be lock-enclosed as desired.

3,667,407

INCINERATOR

Conrad H. Miller, Rogers, Ark., assignor to Hoyt Corporation, Rogers, Ark.

Filed Oct. 13, 1970, Ser. No. 80,351
Int. Cl. F23g 9/00
U.S. Cl. 110—18 C **5 Claims**



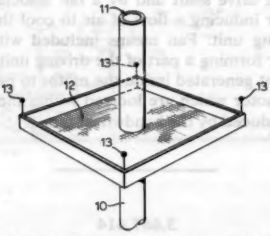
An upright incinerator has a burner at the bottom and a removable one-piece combined grate and flue. This removable unit comprises a bundle of upright bars that define the flue. A grate of bar stock mounted adjacent the lower end of the upright bundle comprises a plurality of circular bars interconnected to the flue by outwardly extending bars. The unit rests removably on the grate.

3,667,408

FLARE STACK

Victor Jasinsky, and Ambrose T. Upfold, both of Sarnia, Ontario, Canada, assignors to Polymer Corporation Limited

Filed Aug. 4, 1970, Ser. No. 60,831
Int. Cl. F23j 15/00
U.S. Cl. 110—119 **7 Claims**



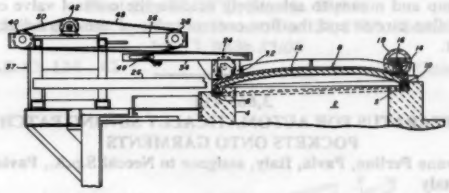
Flare stack smoke is reduced or eliminated by controlling the temperature of the flare. Said temperature is sensed by a sensing element e.g. one or more thermocouples connected in parallel and located in the vicinity of the flare; the sensing element produces a signal which directly or indirectly activates steam control valve to adjust the flow of steam to the tip of the flare stack so as to raise or lower the flare temperature to the temperature of optimum combustion of flare stack effluent.

3,667,409

SOAKING PIT

Fred J. Motz, McKeesport, and Stephen Shufran, North Versailles, both of Pa., assignors to United States Steel Corporation

Filed July 30, 1970, Ser. No. 59,408
Int. Cl. F23m 7/00
U.S. Cl. 110—173 A **5 Claims**



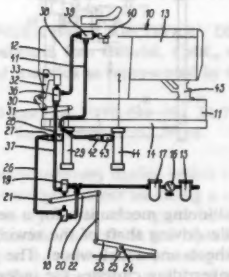
A soaking pit has a sand seal for the cover of its opening which extends around the top of the walls of the pit. The bottom of the sand seal trough is lower at the cover approach end than at the opposite end and the trough slopes upwardly along each side from the approach end. A peripheral flange on the cover extends into the sand in the trough with the bottom of the flange being spaced the same distance from the bottom of the trough around its periphery. Improved means for moving the cover between operative and inoperative positions includes a drum mounted on a fixed frame. The drum rotates about a generally horizontal axis transverse to the direction of movement of the cover. A first sheave is mounted on the stationary frame substantially parallel to the drum on the side thereof toward the pit opening, a wire rope passes around the first sheave with one end secured to the drum and the other end secured to the cover. A second sheave is mounted on the frame substantially parallel to the drum on the side thereof away from the pit opening. A second rope passes around the second sheave with one end attached to the drum and the other end attached to the cover. The drum is rotated by a reversible motor to move the cover.

3,667,410

DRIVE AND CONTROL SYSTEM IN SEWING MACHINES PRODUCING GROUPS OF STITCHES

Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed Apr. 23, 1970, Ser. No. 31,252
Claims priority, application Italy, Apr. 23, 1969, 32410 A/69
Int. Cl. D05b 69/20
U.S. Cl. 112—67 **1 Claim**



The present invention is a pneumatically actuated control system for sewing machines to begin and end the sewing cycle and simultaneously to place and retain the work clamp

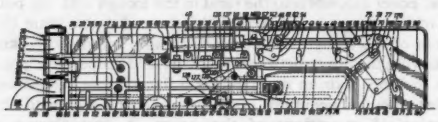
or presser foot into proper relationship with the material during the sewing cycle and comprises a first pneumatic circuit of a control valve, adjustable inlet valve and exhaust valve which circuit is mechanically linked to the sewing cycle control element in the sewing machine and a second pneumatic circuit of a first control valve, a second control valve actuated by the mechanical linkage of the first circuit, a third control valve actuated by the work clamp control element in the sewing machine, an adjustable inlet valve, and an exhaust valve which second circuit is mechanically linked to the work clamp and means to selectively actuate the control valve of the first circuit and the first control valve of the second circuit.

3,667,411

APPARATUS FOR AUTOMATICALLY SEWING PATCH POCKETS ONTO GARMENTS

Silvano Perlino, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed July 14, 1970, Ser. No. 54,723
Claims priority, application Italy, July 21, 1969, 32414 A/69
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 **4 Claims**



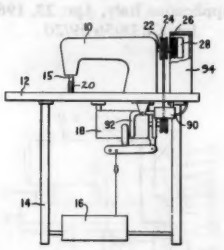
A sewing machine for sewing patch pockets onto garments and comprising a pocket clamping and folding device correlated with a guide system for moving the clamping device relative to the machine needle. The clamping device includes a plurality of pocket forming blades all actuated by a single drive means.

3,667,412

NEEDLE POSITIONING MECHANISM FOR SEWING MACHINES

Martin R. Peria, 75 Lounsbury Road, Fairfield, Conn.

Filed July 2, 1970, Ser. No. 51,833
Int. Cl. D05b *69/22*
U.S. Cl. 112—219 A **12 Claims**



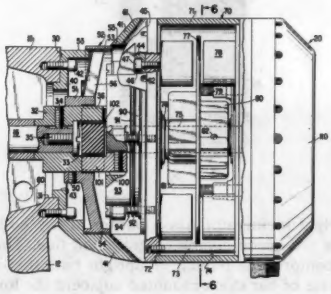
A needle positioning mechanism for a sewing machine in which the needle driving shaft of the sewing head mounts a pair of pulley wheels and a lock wheel. The pulley wheels are mounted with overriding clutches for independently driving the shaft; one pulley wheel connected to the main motor of the machine and the other to an auxillary motor having juxtaposed switches in its circuit; one normally open and the other normally closed. A lock arm having a detent projection at one end is movable by a solanoid energized by an operator into contact with the lock wheel which is provided with at least one detent recess. In its movement against the lock wheel, the lock arm closes the normally open switch as it contacts the surface of the lock wheel, to activate the auxillary motor, and then closes the normally open switch to deactivate the auxillary motor as its projection engages within the detent recess of the lock wheel.

3,667,413

COOLING SYSTEMS FOR SEWING MACHINE DRIVING UNITS

Johann O. Kleinschmidt; Heinz E. Walter, both of Blankenloch, and Helmar H. Holl, Karlsruhe, all of Germany, assignors to The Singer Company, New York, N.Y.

Filed June 11, 1971, Ser. No. 152,139
Int. Cl. D05b *69/00*
U.S. Cl. 112—220 **7 Claims**



An electrically operated driving unit for a sewing machine is supported on the sewing machine in axial alignment with the main shaft of the sewing machine with which the driving unit is operatively connected. The flow of heat from the driving unit to a handwheel on the main shaft adjacent thereto is controlled by an insulated interposer between the driving unit and main drive shaft and by a fan associated with the handwheel for inducing a flow of air to cool the handwheel and the driving unit. Fan means included within a sealed electric motor forming a part of the driving unit also induces transfer of heat generated inside the motor to peripheral portions of the motor which are located within the influence of the air flow induced by the handwheel fan.

3,667,414

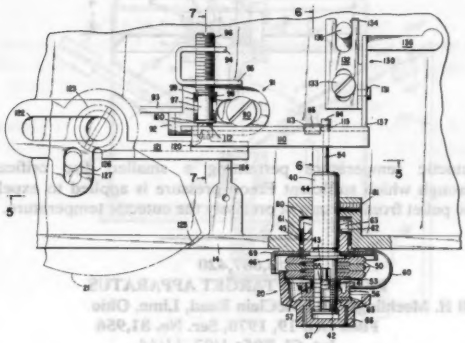
THREAD TENSIONING DEVICE FOR SEWING MACHINES

Stephen J. Illes, Summit, N.J., and Salvatore A. D'Orio, Staten Island, N.Y., assignors to The Singer Company, New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,430
Int. Cl. D05b *47/00*
U.S. Cl. 112—254 **5 Claims**

A needle thread tensioning mechanism for a sewing machine which is arranged in the removable top cover of a sewing machine bracket arm. A diminutive thread engaging

head and operator influenced tension adjusting member protrude exteriorly of the top cover, while the mechanisms



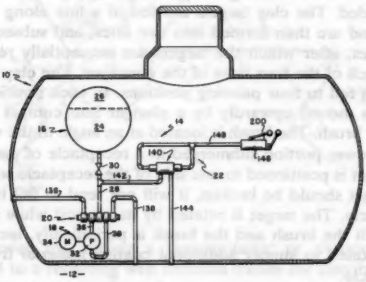
for influencing the tension imposed upon the thread and a tension releasing means are carried inside the top cover.

3,667,415

BUOYANCY CONTROL SYSTEM FOR DEEP DIVING SUBMERSIBLES

Roland W. Robbins, Jr., Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 26, 1970, Ser. No. 84,010
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 E **6 Claims**



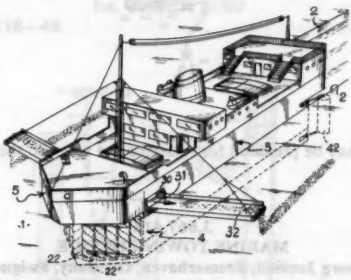
A buoyancy control system for a submersible having a hard ballast tank, a pump, an automatic spool positioning valve and a metering valve for transferring water ballast between the tank and ambient regardless of the direction in which the pressure gradient is working. The pump is only required to move water in one direction, which is against the pressure gradient, with the automatic spool positioning valve setting itself to control flow in the proper direction. Flow with the pressure gradient is controlled by a metering valve.

3,667,416

DEVICES FOR CUTTING A CHANNEL IN A LAYER OF ICE, AND AN ICE-BREAKER SHIP EQUIPPED WITH SAID DEVICES

Jean Floravanti, 3 Allee du Cedre, Chatenay-Malabry, Hautes de Seine; Robert Lucien Carriere, 28 Avenue Daniells Casanova, Saint-Gratien, Val d'Oise; Paul Thibault, 30 Avenue de Ceinture, Enghien-les-Bains, Val d'Oise, and Alain J. F. R. Floravanti, 3 Allee du Cedre, Chatenay-Malabry, Hauts de Seine, all of France

Filed July 27, 1970, Ser. No. 58,246
Claims priority, application France, Dec. 24, 1969, 6944891
Int. Cl. B63b *35/08*
U.S. Cl. 114—42 **16 Claims**



The invention relates to a method of and devices for cutting a channel in a layer of ice covering the surface of an expanse of water, said method utilizing a rotary cutting device actuated from an independent source of power, the cutting force being directed in a substantially horizontal plane and being applied over a limited ice-cutting front. The broken pieces of ice are given a lateral vertical direction, upwards or downwards, and are ejected outside the edges of the cut channel. The rotary cutting device comprises two sets of spiral-blade cutters with inserted knives, one set on each side of the longitudinal axis, the cutters of each set rotating in opposite direction. An ice-breaker ship incorporating the invention has conveyor means for transferring the cut ice away from the channel, auxiliary screws on each side of the front portion and auxiliary devices at the sides of the stern for varying the direction of the cut channel.

3,667,417

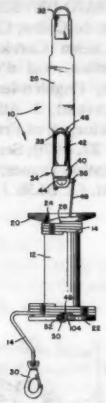
MESSENGER BUOY RECOVERY DEVICE

James D. Clinkenbeard, San Gabriel, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 24, 1970, Ser. No. 31,715
Int. Cl. B63c *7/02, 7/26*
U.S. Cl. 114—51 **10 Claims**

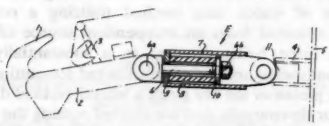
A messenger buoy recovery device which can be attached by a diver to a submerged object including a spool for exteriorly winding recovery cable, the spool having an interior receptacle; an inflatable float which is adapted to be received within said receptacle; means for retaining the float in the receptacle in a deflated condition; and the flat having means for manually pulling the float from the receptacle. The float may be retained within the receptacle by friction between the float and the wall of the receptacle, and means may be provided for automatically inflating the buoy when the buoy is pulled from the receptacle. The recovery device may further

include a winding assembly which has a winding spindle which is adapted to be received by the spool receptacle, and



means may be provided for retaining the spool to the winding spindle.

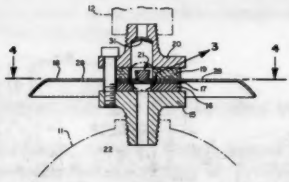
3,667,418
MARINE TOWING DEVICE
Hans-Georg Janssen, Bremerhaven, Germany, assignor to Aktien-Gesellschaft "Weser", Bremen, Germany
Filed Mar. 13, 1970, Ser. No. 24,416
Claims priority, application Germany, Mar. 15, 1969, G 69 10 623
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 A **10 Claims**



A marine towing device has support means which is to be mounted on a marine vessel. A hook is pivotably mounted in a frame and interposed between and connected with both the support means, and the hook is an elastically yieldable unit which yields elastically to a predetermined maximum extent if tensile forces develop between the support means and the hook, as when the latter is engaged with an element to be towed.

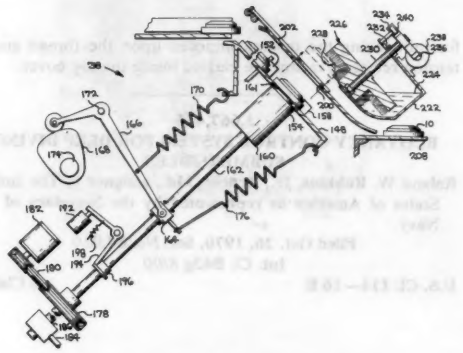
3,667,419
PRECISION TEMPERATURE DETECTION AND ALARM SYSTEM
Joseph T. Sullivan, Huntingdon Valley, Pa., assignor to Standard-Farrington Alarm & Signal Corp., Trevose, Pa.
Filed Sept. 28, 1970, Ser. No. 76,017
Int. Cl. G08b *17/00*
U.S. Cl. 116—106 **4 Claims**

A temperature sensing and alarm system for quickly and accurately sensing a sharply defined temperature threshold, comprising a Freon powered horn, the Freon stored in a cylinder and normally blocked from passage to the horn by a eutectic pellet bonded in a brass cup and blocking a Freon release orifice. A heat collector is held in tight contact with an activator disc which contains the aforementioned cup, the cup having angled side walls of a thickness less than the disc portion in contact with the heat collector, thereby providing rapid and uniform heat transfer to the inter-molecular bond between the pellet and the cup, the rapid heat transfer at the



eutectic temperature permitting a smaller disc orifice through which sufficient Freon pressure is applied to expel the pellet from the cup at precisely the eutectic temperature.

3,667,420
FRANGIBLE TARGET APPARATUS
Eli H. Mechling, 2881 McClain Road, Lima, Ohio
Filed Oct. 19, 1970, Ser. No. 81,956
Int. Cl. B05c *1/02*, *11/14*
U.S. Cl. 118—6 **10 Claims**

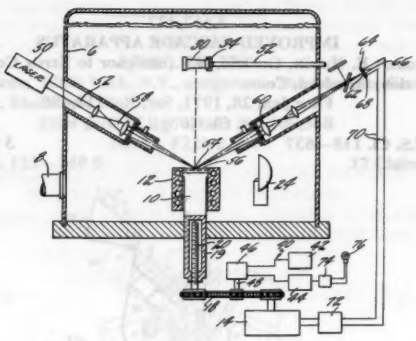


Apparatus for handling and painting clay pigeons or targets is provided. The clay targets are fed in a line along a conveyor and are then formed into two lines, and subsequently four lines, after which the targets are sequentially removed from each of the four lines of the conveyor. The clay targets are then fed to four painting positions. In each position, the target is moved upwardly by a plunger into contact with a circular brush. The brush is located at an angle to the vertical with a lower portion submerged in a receptacle of paint and the target is positioned to one side of the receptacle so that if the target should be broken, it will not tend to fall into the receptacle. The target is rotated by its support while in contact with the brush and the brush is periodically, incrementally rotated to supply additional coating material from the receptacle.

3,667,421
MECHANISM FOR CONTROLLING THE THICKNESS OF A COATING IN A VAPOR DEPOSITION APPARATUS
Mitchell J. Bala, Enfield, and Sol S. Blecherman, Newington, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Continuation-in-part of application Ser. No. 806,872, Mar. 13, 1969, now abandoned. This application Sept. 17, 1970, Ser. No. 72,966
Int. Cl. B05c *11/00*; C23c *13/08*
U.S. Cl. 118—7 **2 Claims**

Apparatus for accurately determining and continuously measuring the thickness of a coating deposited on a substrate

in a vacuum deposition chamber and for terminating the coating operation after the desired thickness is obtained, the apparatus utilizing a mechanical counter for determining the length of ingot fed to the crucible in combination with a



precision laser device for maintaining a constant pool level in the crucible since the length of ingot fed is a direct indication of the thickness of the coating deposited.

3,667,422

APPARATUS FOR TRANSFERRING A PARTICULATE MATERIAL TO A WEB

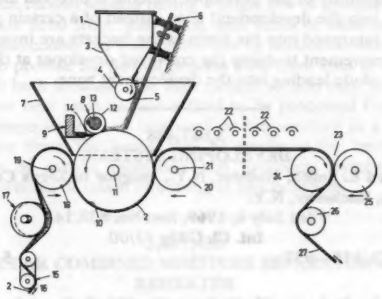
Benno Saladin, Sirnach, Switzerland, assignor to Saladin A. G., Sirnach/TG, Switzerland

Filed Nov. 14, 1968, Ser. No. 775,819

Claims priority, application Austria, Nov. 20, 1967, A 10399/67

Int. Cl. B05c *1/08, 1/16*

U.S. Cl. 118—34 **8 Claims**



A device for adding a thermoplastic or thermosetting material to a receiving web includes means for distributing a particulate material throughout recesses or grooves defined on the surface of an endless member such as a continuously rotating drum. The grooves which have been filled with the material are then moved into association with a web of a material such as a textile material which is moved into contact with the drum and at the same speed as the drum while it is maintained at a temperature great enough to cause the tackiness and adherence of the particulate material to the web in the pattern defined by the grooves of the drum. The granules are advantageously directed to the top face of the drum as it rotates and the web is advantageously delivered to a location at which it feeds around a major portion of the lower part of the drum surface. A pressure roller is located at the infeed of the web and at the outfeed of the web and is advantageously maintained in a heated condition to provide a temperature to facilitate the transfer of the thermoplastic material from the grooves of the drum to the surface of the web. The particulate coating material is delivered to the backing material web at a coating station while the material is maintained at a temperature lower than that at which it is applied to the backing material. Conversely, the backing material is maintained at or heated to a temperature at which the particulate material will become tacky and move into adhering engagement with the backing material as it is transported into association therewith at the coating station.

3,667,423

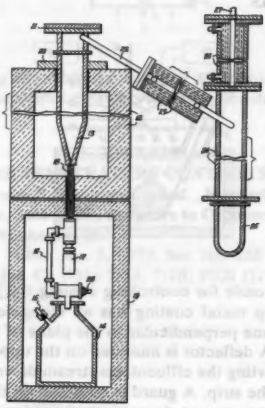
METAL VAPOR COATING APPARATUS

Adrian Monroe Gammill, Ashton, Md.; Franklin Keith Guinn, Johnson City, Tenn.; Urban S. Bird, Unicoi, Tenn., and William R. Housholder, Erwin, Tenn., assignors to Nuclear Fuel Services, Inc., Wheaton, Md.

Filed Dec. 6, 1968, Ser. No. 781,928

Int. Cl. C23c *11/00*

U.S. Cl. 118—48 **3 Claims**



An apparatus for coating nuclear fuel particles with a metal by the decomposition of the metal salts and the deposition of the free metal on the fuel particles.

3,667,424

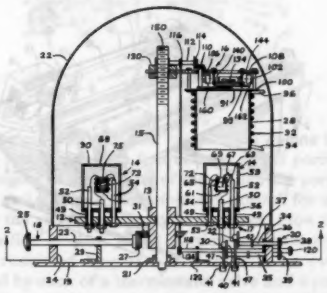
MULTI-STATION VACUUM APPARATUS

William L. Cornelius, Mountain View, and John G. Martner, Atherton, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Apr. 14, 1969, Ser. No. 815,814

Int. Cl. C23c *13/12*

U.S. Cl. 118—49.5 **7 Claims**



A high-current vacuum system suitable for on-vacuum deposition of multiple layers onto a substrate. A vacuum

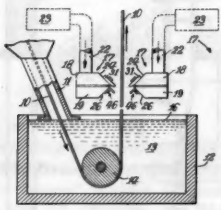
chamber encloses a stationary substrate holder disposed above a plurality of vapor sources utilizing diverse heating elements. The vapor sources are arranged on a rotatable support for sequential movement to a deposition station for the vaporization and deposit of low and high temperature metals and dielectrics. Manipulators for making and breaking electrical contact to the station and for rotation of the support are positioned without the chamber and are externally operated to change sources without breaking vacuum. A liquid nitrogen cooled cold cam is situated between the station and the substrate support to funnel the vapor stream toward the stationary substrate target.

3,667,425

APPARATUS FOR CONTROLLING COATING THICKNESS

Wright D. Bozeman, Calumet, Ill., and Clifford D. Blackwell, Crown Point, Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Mar. 1, 1971, Ser. No. 119,479
Int. Cl. B05c *11/06*
U.S. Cl. 118—63 **8 Claims**



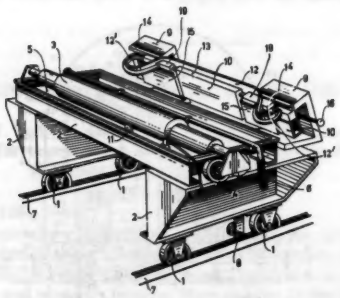
A blowing nozzle for controlling coating thickness in continuous hot dip metal coating has an elongated orifice arranged in a plane perpendicular to the plane of the vertically moving strip. A deflector is mounted on the upper side of the nozzle for diverting the effluent gas stream downwardly at an angle against the strip. A guard is mounted on the lower side of the nozzle to prevent deposition of coating metal on the nozzle in the vicinity of the orifice and on the deflector plate.

3,667,426

DEVICE FOR APPLYING GLUE TO THE SUPPORTING BELT OF A SCREEN PRINTING SCREEN

Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam N.V., Amstelveen, Netherlands

Filed Apr. 15, 1970, Ser. No. 28,622
Claims priority, application Netherlands, May 2, 1969, 6906722
Int. Cl. B05c *11/04*
U.S. Cl. 118—123 **4 Claims**



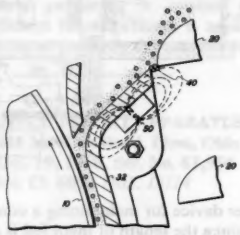
Device for applying a film of glue to a travelling belt of a screen printing machine, especially for textile fabric, said device comprising a roller contacting the belt along a genatrix on one side and dipping into a glue trough on the opposite side, further comprising a flexible doctor lying mainly parallel to said roller and having means to curve an adjustable length of both end parts towards said roller.

3,667,427

IMPROVED CASCADE APPARATUS

Robert E. Hewitt, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1971, Ser. No. 110,488
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **3 Claims**



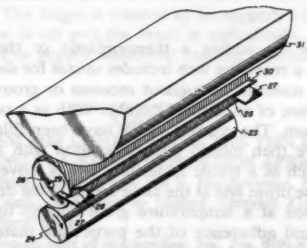
Improved cascade apparatus for developing electrostatic images wherein a latent electrostatic image supported on a moving member is developed by cascading a flow of developer material including a magnetic component and an electroscopic component through a development zone. A chute receives a sufficient quantity of the developer material from a conveyor which moves the developer material in buckets from a sump and unloads a developer material at the inlet side of the chute. A magnetic member is positioned at the inlet side of the chute in close proximity to the path of the conveyor to affect the buildup of the magnetic developer material in the path of the conveyor buckets such that a sufficient quantity of the developer material is directed along the chute into the development zone instead of a certain portion being returneed into the sump as the buckets are inverted by their movement to dump the conveyed developer at the inlet of the chute leading into the development zone.

3,667,428

DEVELOPING SYSTEMS

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 1, 1969, Ser. No. 838,141
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **5 Claims**



A development system is provided wherein a movable developer loaded applicator surface is first doctored on the edges and corners of the surface to remove excess developer and prevent the accumulation of developer on the corners and is finally doctored with another doctoring surface along

the entire applicator surface to provide a uniform distribution of developer on the surface which doctored applicator surface is brought into developing engagement with an image to be developed. Dry and liquid development techniques can be employed and the doctoring surfaces may be provided by doctor blades or rollers.

3,667,429

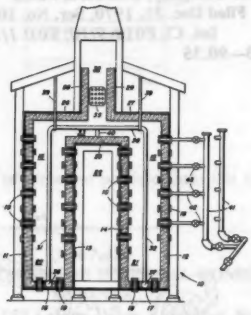
FIRED HEATER

Alan Cross, Little Neck, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jan. 25, 1971, Ser. No. 109,368

Int. Cl. F22b *21/30*

U.S. Cl. 122—240 B **17 Claims**



A fired heater having two parallel vertical radiant sections essentially completely separated from each other and a convection section above and offset from both radiant sections with each radiant section having a single row of process tubes which are fired from both sides, with tubes of each section being interconnected with each other by horizontal crossover tubes to provide for flow of process fluid from inlet to outlet through both sections. The inlet radiant section may be fired at higher heat rates to heat a fluid to be processed from an inlet temperature to an intermediate temperature in a short residence time. The heater may be employed for: heating a mixture of carbon monoxide and hydrogen; pyrolysis of hydrocarbons; or steam reforming of hydrocarbons.

3,667,430

MODULAR COMBINED MOISTURE SEPARATOR AND REHEATER

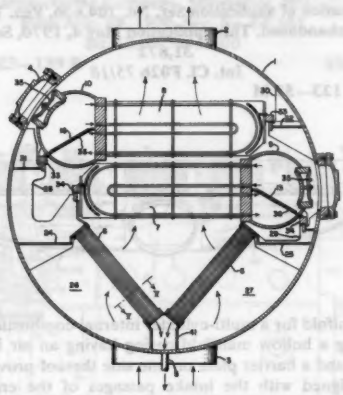
William Schenck Hubble; Kenneth K. Woods, both of Cape Elizabeth, Maine, and Salvatore S. Tramuta, Schenectady, N.Y., assignors to General Electric Company

Filed June 4, 1970, Ser. No. 43,359

Int. Cl. F22g *5/16*

U.S. Cl. 122—483 **7 Claims**

A combined moisture separator and reheater suitable for a nuclear steam turbine-generator powerplant has modular reheater stages in which the tubes extend in a transverse direction to the shell centerline and a pair of moisture separator elements which are positioned in parallel along either side of the shell. The steam to be reheated enters the shell through a plurality of openings towards the bottom of the shell and flows generally in a vertical direction up through the moisture separator elements and over the rows of reheater tubes and then out of the shell through a plurality of openings toward the top thereof. A uniform flow is maintained by the appropriate arrangement of the reheater stages and the moisture separator elements. By standardizing the cross section of the combined moisture separator and reheater, the overall capacity may be readily increased by



simply adding any desired number of additional axial sections of moisture separator elements and reheater stages.

3,667,431

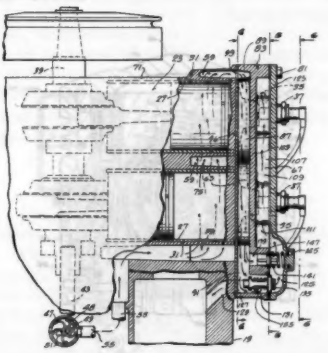
ENGINE TEMPERATURE CONTROL SYSTEM

Don F. Kueny, Waukegan, and Howard M. Pollari, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 5, 1970, Ser. No. 635

Int. Cl. F01p *7/14, 7/16*; F02f *1/10*

U.S. Cl. 123—41.08 **20 Claims**



Disclosed herein is an internal combustion engine including a cooling system having a first coolant jacket portion for cooling the engine in the vicinity of the cylindrical portion of the cylinders and a second coolant jacket portion for cooling the engine in the vicinity of the cylinder heads. Flow of coolant from the first coolant jacket portion is selectively controlled by a restricted by-pass which leads to an overflow discharge, and by each of a thermostatic valve and a pressure responsive valve which are operable to afford coolant flow from the first coolant jacket portion to the second coolant jacket portion when the temperature or pressure in the first coolant jacket portion is above a predetermined value.

3,667,432

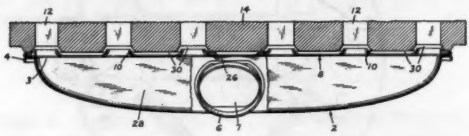
ENGINE AIR MANIFOLD

Jack F. Greathouse, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Continuation of application Ser. No. 704,636, Feb. 12, 1968, now abandoned. This application May 4, 1970, Ser. No. 31,872

Int. Cl. F02b *75/18*

U.S. Cl. 123—52 M 5 Claims



A manifold for a multi-cylinder internal combustion engine including a hollow manifold casing having an air inlet connection and a barrier plate on one side thereof provided with ports aligned with the intake passages of the engine, the manifold being mounted on the engine block or cylinder head with the barrier plate spaced from the head or block to enable an insulating barrier of air to be maintained between the barrier plate of the manifold and engine for reducing the transfer of heat from the engine to the air admitted into the engine cylinders, and openings through the baffle plate allowing air to flow from the passageway to the ports.

3,667,433

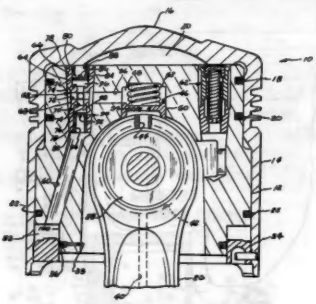
VARIABLE COMPRESSION RATIO PISTON INCLUDING OIL FILTER MEANS

Walter F. Isley, Grosse Pointe, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed June 1, 1970, Ser. No. 41,918

Int. Cl. F02b *75/04*

U.S. Cl. 123—78 B 13 Claims



A two-part variable compression ratio piston provided with an upper and lower chamber, supply valve means connected with the lubrication system of the engine for supplying oil to the chambers in a manner which permits the parts by inertia forces and the forces generated by combustion chamber pressures to move relative to each other at a controlled rate to increase the compression ratio of the engine until a predetermined constant maximum combustion chamber pressure has been achieved, a discharge valve assembly for discharging some of the oil from the upper chamber to the engine crankcase when the pressure in the upper chamber exceeds a predetermined maximum value and a restricted discharge orifice formed in the inner member and connected to the lower chamber for discharging a controlled quantity of oil therefrom. The supply valve and discharge valve assembly are each formed with a conically shaped exterior surface that mates with a similarly shaped hole within the inner piston member for retaining the valves therein. A narrow annulus is formed between the inner member and the discharge valve for filtering oil before it enters the discharge valve so that impurities which might retain the valve in an opened position are filtered out of the oil. A second narrow annulus is provided between the discharge orifice and the lower chamber so that impurities that might plug up the orifice are filtered out of the oil.

3,667,434

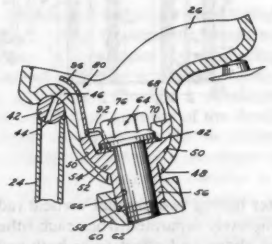
ROCKER ARM ASSEMBLY INCLUDING FULCRUM MOUNTED LUBRICANT DEFLECTOR

Bernard J. Sandusky, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 31, 1970, Ser. No. 103,218

Int. Cl. F01m *9/10*; F01l *1/18*

U.S. Cl. 123—90.35 8 Claims



A rocker arm assembly for the operation of a valve in an internal combustion engine in which the rocker arm is pivotally mounted on a fulcrum supported by the cylinder head of the engine. A lubricant deflecting means mounted on the fulcrum is employed to deflect lubricant that flows through a push rod having a lubricant passage positioned therein and through an aperture in one end of the rocker arm onto the bearing means that pivotally supports the rocket arm on the fulcrum.

3,667,435

VEHICULAR ENGINE BRAKE ASSEMBLY

Richard M. Bygdnes, Atherton, Calif., assignor to said Richard M. Bygdnes, by said Perry A. Bygdnes

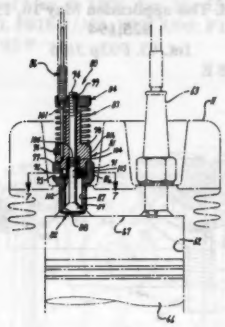
Continuation-in-part of application Ser. No. 797,841, Feb. 10, 1969, now abandoned. This application Apr. 13, 1970, Ser. No. 27,666

Int. Cl. F01l *13/08*

U.S. Cl. 123—97 B 9 Claims

An engine brake for a two-cycle engine equipped vehicle is operative through selective venting of the engine's combustion chamber and includes a plug with an actuable poppet valve arranged in a passageway communicating with the combustion chamber. In one form, a collector receives gases passing from the passageway, the collector being in communication with a conduit extending to a controlled air source so that gases passing to and from the combustion chamber to

the atmosphere pass through the controlled air source. In another form, a one-way check valve permits gas discharge



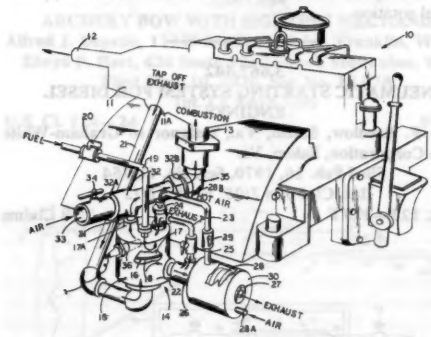
but impedes entry of airborne particles into the combustion chamber.

3,667,436

FUEL GASIFICATION FOR INTERNAL COMBUSTION ENGINES

Robert Reichheim, 155 LePore Drive, Lancaster, Pa.

Filed Jan. 14, 1970, Ser. No. 2,880
Int. Cl. F02m *25/06, 17/18, 31/08*
U.S. Cl. 123—119 A **9 Claims**



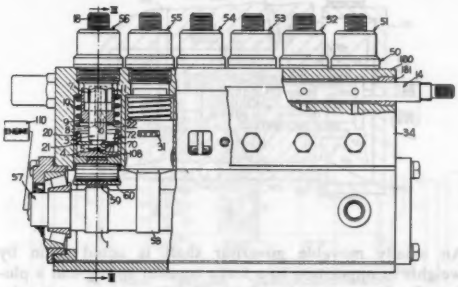
A system and method is provided adapted to utilize low-grade liquid fuel in an internal combustion engine providing a gasification chamber and a method for introducing the low-grade liquid fuel into the gasification chamber while at the same time directing a portion of the engine exhaust products to the gasification chamber for direct mixture with the liquid fuel to gasify the liquid fuel and thereafter conducting the fuel to the engine system. There is also provided a system for additional indirect heating of the liquid fuel by circulating a portion of the engine exhaust products to the gasification chamber without direct mixture with the fuel, and auxiliary heat to provide gasification of the liquid fuel on start-up. Air may also be introduced into the gasification chamber and, preheated.

3,667,437

MULTIPLE PLUNGER FUEL INJECTION PUMP

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 19, 1970, Ser. No. 65,202
Int. Cl. F02m *59/00*
U.S. Cl. 123—139 R **10 Claims**



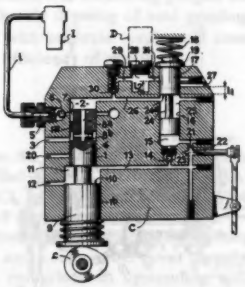
Multiple plunger fuel injection pump having built in fuel injection timing and quantity control.

3,667,438

FUEL INJECTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Jean Moulin, Chatou, and Marcel Regneault, Paris, both of France, assignors to Automobiles Peugeot, Paris, France

Filed Sept. 29, 1970, Ser. No. 76,444
Claims priority, application France, Dec. 19, 1969, 6944138
Int. Cl. F02m *39/00, 59/34*
U.S. Cl. 123—139 AS **4 Claims**



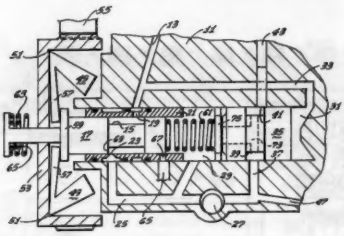
Fuel injecting device for an internal combustion engine comprising at least one injection pump connected to at least one injector and a regulating system of the liquid abutment type formed by a fuel relief or discharge passageway for the injection pump in which is interposed a movable closing member whose movement is controlled by a fluid pressure regulated by an acceleration control of the engine so that the amount of fuel delivered for each stroke of the pump is determined by the movement of the closing member. The characteristic of the injecting device is that a fuel deducting chamber having an inlet constituted by a throttling orifice is connected in parallel with the discharge passageway upstream of the closing member.

3,667,439

TORQUE AND SPEED CONTROL GOVERNOR

Earl B. Muir, Palos Verdes Peninsula, Calif., assignor to White Motor Corporation, Cleveland, Ohio

Filed Aug. 7, 1970, Ser. No. 61,980
Int. Cl. F02d 1/04
U.S. Cl. 123—140 MC 21 Claims



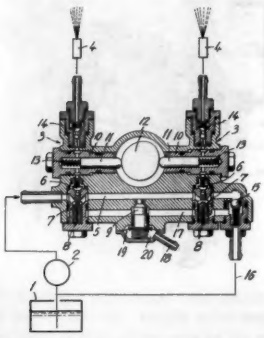
An axially movable governor shaft is acted upon by flyweights in opposition to a force transfer spring and a plurality of torque control springs. The force exerted by the springs is increased or decreased by a fuel pressure differential measured at a variable orifice at the fuel inlet. The position of a servo valve is controlled both by the pressure differential and by the position of the governor shaft to control a flow metering orifice through which fuel to be injected into the engine must pass.

3,667,440

FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Hiroyuki Yoshino, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1970, Ser. No. 80,631
Claims priority, application Japan, May 21, 1970, 45/49063
Int. Cl. F02d 1/04
U.S. Cl. 123—140 MP 7 Claims



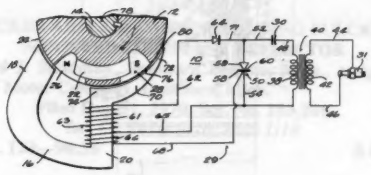
An apparatus is provided for stopping fuel injection in a fuel injection type internal combustion engine wherein a fuel supply passage for a fuel injection pump incorporates a pusher facing an inlet valve of the pump. The pusher is arranged such that during ordinary engine operation, the pusher is retracted to an inoperative position by the supply pressure of the fuel within the fuel supply passage whereas a valve is displaced upon rapid reduction of engine speed to connect the fuel supply passage with the outside atmosphere.

3,667,441

CAPACITOR DISCHARGE IGNITION SYSTEM WITH AUTOMATIC SPARK ADVANCE

David T. Cavil, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of application Ser. No. 647,426, June 20, 1967, now abandoned. This application May 16, 1969, Ser. No. 825,194
Int. Cl. F02p 3/06
U.S. Cl. 123—148 E 17 Claims



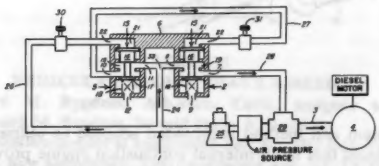
Disclosed herein is a capacitor discharge ignition system which utilizes a magneto-type flywheel assembly with a permanent magnet located in the flywheel to induce a voltage pulse in a charge coil located on one leg of a U-shaped coil core to charge a capacitor and to induce a trigger pulse in a trigger coil to trigger a silicon controlled rectifier which thus becomes conducting and closes a circuit between the capacitor and the primary coil of a transformer for discharge of the capacitor. In the disclosed construction, the charging and triggering coils constitute portions of a single coil to advance the time at which the capacitor discharges and accordingly to fire the associated spark plug prior in time to the normal firing time in relation to engine crankshaft position, the coil core is provided with an extension or foot which extends circumferentially of the flywheel in the direction opposite flywheel rotation.

3,667,442

PNEUMATIC STARTING SYSTEM FOR DIESEL ENGINES

Harvey F. Bredlow, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.

Filed Feb. 16, 1970, Ser. No. 11,754
Int. Cl. F02n 7/08; F16k 31/12
U.S. Cl. 123—179 F 8 Claims



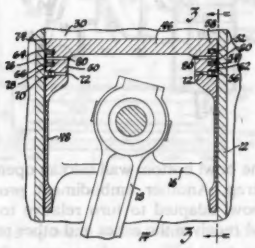
A pair of normally open, air-actuated valves supplied from a common pressure source and acting respectively as a line valve and a pilot valve, the latter for controlling with associated time delays closing and reopening of the line valve, for automatically purging a diesel engine of any liquid condensate by applying operating air to the engine's air starter motor in two separate stages, one brief and the other extended.

3,667,443

INTERNAL COMBUSTION ENGINE WITH VENTED PISTON CLEARANCE SPACES AND METHOD

James H. Currie, Rochester, and Stanley H. Mick, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1970, Ser. No. 15,494
Int. Cl. F01b *31/00*; F02f *3/00*; F16j *1/00*
U.S. Cl. 123—193 P 6 Claims



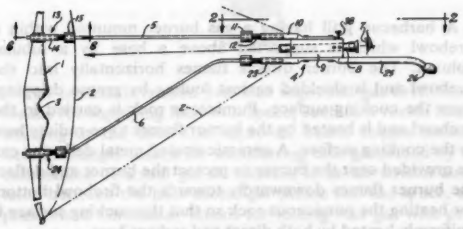
An internal combustion engine is provided with pistons having vent openings connecting the space between the first and second piston rings with the engine crankcase so as to vent to the crankcase hydrocarbon-rich gases which escape from the combustion chamber past the first piston ring. This method of venting the clearance space has been shown to reduce hydrocarbon emissions in some instances.

3,667,444

ARCHERY BOW WITH SIGHTING MECHANISM

Alfred J. Depatie, 12229 McShane Drive, Franklin, Wis., and Elwyn P. Hart, 426 South 92nd Street, Milwaukee, Wis.

Filed Mar. 10, 1970, Ser. No. 18,078
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 9 Claims



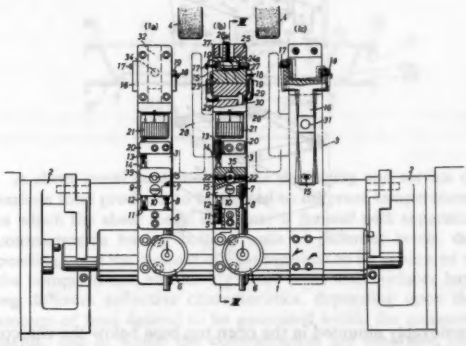
An archery bow with a telescopic sight windage is attached to a bow by a frame which locates the eye sighting portion of the sight immediately adjacent to the shooter's eye with the arrow and string drawn back preparatory to actual shooting. The mounting frame is light weight and adjustably connected to the bow for adjusting the position of telescopic sight relative to the archer. The frame includes a locating element adjacent the archer's head for positioning of the sight with respect to the archer. A string guide is provided with an accurate reference point to which the bow string and arrow is drawn each time.

3,667,445

SIDE-DRESSING APPARATUS FOR A GRINDING MACHINE

Hiroshi Ota, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan

Filed Aug. 21, 1970, Ser. No. 65,931
Claims priority, application Japan, Aug. 25, 1969, 44/81082
Int. Cl. B24b *53/12*
U.S. Cl. 125—11 DF 11 Claims



A side-dressing apparatus for a grinding machine having a chuck means for journaling workpieces transversely of a plurality of parallel grinding wheels, comprising a plurality of dressing members mounted at a precise angle to said grinding wheels on a holding member journaled on said chuck means, and transverse to the grinding wheels, said dressing members being provided with feeding means including adjusting knobs to modulate the rightward and leftward movements of diamond dressers set in slidable members engaged in the top ends of said dressing members, and means to measure the dressing amount to be applied to the sides of the grinding wheels, said measuring means having measuring arms, operation rods for said measuring arms, movable members moved by said rods, resilient members to hold said movable members normally in a neutral position, feelers operated by said movable members, and measuring gauges, whereby easy, efficient, and safe side dressing of said grinding wheels may be accomplished with accurate results and consequent increase in production efficiency of grinding.

3,667,446

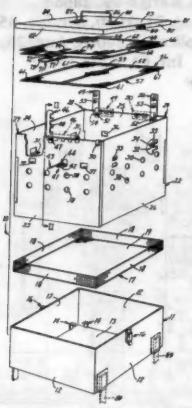
CHARCOAL GRILL

Paul S. Morton, 82 Mandalay Drive, Oshtemo, Mich.

Filed Aug. 12, 1970, Ser. No. 63,166
Int. Cl. A47j *37/00*; F24b *3/00*; F24c *1/16*
U.S. Cl. 126—9 R 14 Claims

A portable and collapsible charcoal burning grill having an open top base and a removable cover therefor. The grill construction also comprises an upstanding collapsible support member adapted to be mounted on the open top base when in a position of use around the perimeter of the open top, the support member being also adapted to collapse and be received in the open top base for storage therein. A charcoal holding grate is provided and is adapted to be removably mounted on the support member when in a position of use and further adapted to be receivable in the open top base along with the collapsed support member for storage therein. A food holding grill is also provided and adapted to be removably mounted on the support member when in a position of use and spaced upwardly from the charcoal holding grate. The food holding grill is also adapted to be receivable in the open top base along with the collapsed support member and the charcoal holding grate for storage therein. The base has a sufficient depth to permit the cover to cover the open top to thereby permit a storage of the collapsed

support member, the charcoal holding grate means and the food holding grill means within the base. If desired, a charcoal collecting member may be provided and adapted to be



removably mounted in the open top base below the charcoal holding grate when in the position of use.

3,667,447

GAS-FIRED DOMESTIC OVENS

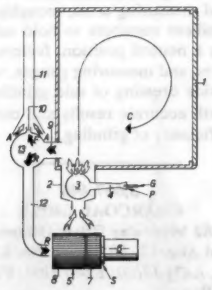
Bela M. Toth, and Ian Thow, both of Solihull, England, assignors to Parkinson Cowan Limited, London, England

Filed June 19, 1970, Ser. No. 47,798

Claims priority, application Great Britain, June 21, 1969, 31,451/69

Int. Cl. F24c *15/32*

U.S. Cl. 126—21 A **3 Claims**



In a domestic gas-fired oven of the pyrolytic self-cleaning type with a forced-draught fan re-circulating a portion of the combustion products back through the oven during self-cleaning the re-circulation ratio, that is to say, the ratio of the total mass circulating to the net mass entering and leaving the system, is between three to one and five to one, being preferably four to one.

3,667,448

PORTABLE BRAZIER WITH CLEANING MEANS

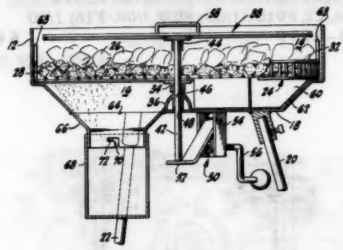
Jack Dorian, 1196 Vermont Way, San Bruno, Calif.

Continuation-in-part of application Ser. No. 59,423, July 30, 1970. This application Jan. 28, 1971, Ser. No. 110,718

Int. Cl. A47j *37/00;* **F24b** *3/00*

U.S. Cl. 126—25 R **15 Claims**

A portable brazier for cooking and barbequing foods. One embodiment of the invention provides a leg-supported bowl provided with a rotatable apertured tray dividing the bowl into upper and lower compartments and adapted to retain the burning coals below a top grill holding the food to be cooked. A scraper blade depends from the tray and is adapted to rotate with the tray for scraping ashes and other



residue from the bowl bottom wall into an opening leading to a removable trap. Another embodiment provides a fixed blade with a bowl adapted to turn relative to the blade. A trap in the bowl receives the ashes and other residue scraped from the bowl.

3,667,449

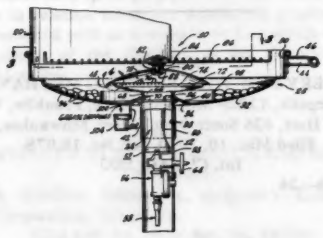
GAS-OPERATED BARBECUE GRILL

Laverne O. Persinger, Burbank, and Merle L. Persinger, Glendale, both of Calif., assignors to Big Boy Manufacturing Co., Inc., Burbank, Calif.

Filed Sept. 8, 1970, Ser. No. 70,263

Int. Cl. A47j *37/00;* **F24c** *3/00*

U.S. Cl. 126—41 R **13 Claims**



A barbecue grill having a gas burner mounted within a firebowl which is supported above a base by a tubular column. The burner directs flames horizontally into the firebowl and is shielded against fouling by grease drippings from the cooking surface. Pumiceous rock is carried in the firebowl and is heated by the burner flames to re-radiate heat to the cooking surface. A ceramic-coated metal deflector can be provided over the burner to protect the burner and deflect the burner flames downwardly towards the firebowl bottom for heating the pumiceous rock so that the cooking surface is uniformly heated by both direct and radiant heat.

3,667,450

OVEN HEATER COMBINATION

Stanley F. Skafte, Arcadia, Calif., assignor to Williams Furnace Co., Buena Park, Calif.

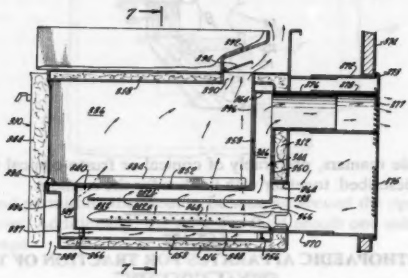
Continuation-in-part of application Ser. No. 16,282, Mar. 4, 1970, now abandoned. This application Oct. 2, 1970, Ser. No. 77,449

Int. Cl. F24c *3/00*

U.S. Cl. 126—85 B **9 Claims**

A closed combustion oven heater combination to be mounted in a room of an enclosed structure, such as a

camper, motor home and the like and having an oven enclosure, a closed combustion chamber disposed under the oven enclosure, ducting for bringing intake air into the combustion chamber from outside the room, heat exchanging flue spaces in communication with the combustion chamber for heating the oven, exhaust ducting communication with the heat



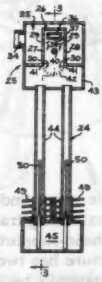
exchanging flue spaces, and a vent to allow heated air to escape from the oven enclosure. The oven enclosure is thus completely closed from the combustion chamber and the air source so that oven enclosure air which may be circulated into a room of the enclosed structure is independent of the air circulation of the combustion chamber.

3,667,451

GAS-FIRED HEATER MEANS

James D. Boucher, Tyler, Tex., assignor to General Electric Company

Filed Aug. 25, 1970, Ser. No. 66,800
Int. Cl. F24h *3/06*
U.S. Cl. 126—110 R **2 Claims**



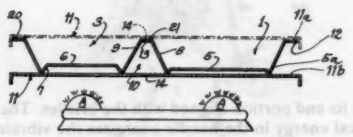
The present invention provides improved gas-fired heater means for supplying heat to a space, such as a room, house, building or the like. The improved heater means includes heat exchanger means for transferring heat generated by the combustion of a fuel gas-air mixture to an air stream circulated between the heat exchanger means and the space, and pressurized combustor means for mixing fuel gas with pressurized air and burning that mixture to provide a source of heat to the heat exchanger means. In accordance with the present invention, the pressurized combustor means has its discharge fluid-connected to the upper portion of the heat exchanger means, and its vent for exhausting the waste products of combustion to the atmosphere is fluid-connected to the heat exchanger means lower portion. With this arrangement, the combustion products will be forced downward through the heat exchanger means and out through the vent by the pressurized air during operation of the combustor means, but condensate which may deposit within the heat exchanger means during dormancy of the combustor means will be directed away from the combustor means by gravity.

3,667,452

CONTAINER FOR THE PRESERVATION AND CONSUMPTION OF DIFFERENT COOKED FOODS

Robert Brebant, 8 bis place Charles Digeon, 94 Saint-Mande, and Maurice P. Tamboise, 78 Crespieres, both of France

Filed Mar. 30, 1970, Ser. No. 23,762
Claims priority, application France, Mar. 31, 1969, 6909706
Int. Cl. F47j *27/00*
U.S. Cl. 126—390 **5 Claims**



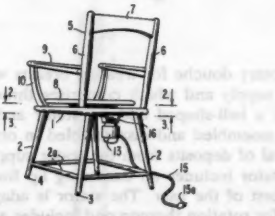
A sheet metal container for the packaging and service of various food products to be heated to different temperatures in which the sheet metal container is formed with separated compartments having bottom walls at different levels, depending upon the amount of heat required to be generated in the compartment, and having outer walls with surfaces having different reflective characteristics, depending upon the amount of heat desired to be generated within the compartments, and in which the compartments are separated one from another with slotted portions in between to minimize heat transfer by conduction and which includes a lid having corresponding differences in heat reflection of the surfaces and with slotted portions therein corresponding to the slotted arrangement in the container.

3,667,453

EXERCISE CHAIR

William G. Schenck, and Earl T. Stark, both of 201 North Riverside Drive, Pompano Beach, Fla.

Filed Mar. 15, 1971, Ser. No. 124,201
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 R **10 Claims**



An exerciser is provided in the form of an armchair having a body-carrying seat member mounted on the chair for rotary reciprocating motion about a vertical axis relative to the chair including its legs, back and arms. Power driving mechanism is provided for effecting the rotary reciprocating motion of the seat member so that a person sitting on the seat will have imparted to his buttocks a movement which will exercise his leg muscles when his feet are on the floor, his arm muscles when his arms or hands are engaging the arms of the chair and his back muscles through his arms or directly if his back is against the back of the armchair.

3,667,454

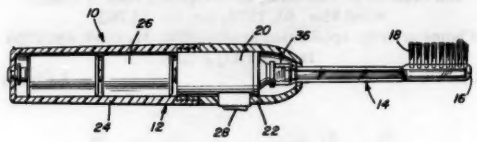
TOOTHBRUSH WITH ULTRAVIOLET EMITTER

Larry W. Prince, 1320 South Depew Street, Denver, Colo.

Filed June 12, 1970, Ser. No. 45,634
Int. Cl. A61h *29/00;* **A46b** *13/02*
U.S. Cl. 128—24.2 **12 Claims**

A powered, vibrating toothbrush from which ultra-violet radiation is emitted at the bristle end. The bristles are carried

on the end of a tubular shank projecting from a handle. A radiation emitting lamp tube is enclosed within the shank, the lamp tube being coated with a radiation blocking material except at its end portion aligned with the bristles. The source of electrical energy in the handle energizes the vibrator and the lamp tube.

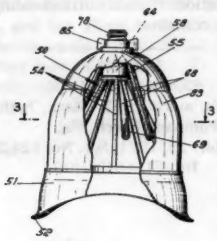


3,667,455

ROTARY DOUCHE FOR TREATING BREASTS

Jacques Courtin, 7 Rue Guenegaud, 75 Paris 6°, France

Filed Apr. 17, 1970, Ser. No. 29,607
Claims priority, application France, July 29, 1969, 6925877
Int. Cl. A61h 9/00
U.S. Cl. 128—66 3 Claims



A rotary douche for treating breasts which is used with a water supply and which comprises three major component parts : a bell-shaped body, a stator and a rotor which are easily assembled and disassembled in order to facilitate the removal of deposits from the water supply such as calcium. The stator includes an extending lip for sealingly engaging the chest of the user. The stator is adapted to support the rotor for rotation thereon and includes a tubular portion extending through a portion of the bell-shaped body remote from the open end and adapted to be connected to a water supply. Ports are provided in the tubular member for conducting the water to the rotor. The rotor includes fingers having orifices at their tips so that the rotor is driven by reaction.

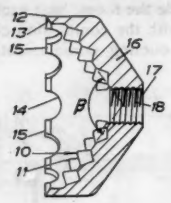
3,667,456

HIP-JOINT OPERATIONS

John Charnley, Hale, England, assignor to Chas. F. Thackray Limited, Leeds, Yorkshire, England

Filed Nov. 19, 1970, Ser. No. 90,914
Claims priority, application Great Britain, Nov. 25, 1969, 57,539/69
Int. Cl. A61b 17/16, 17/32
U.S. Cl. 128—92 R 5 Claims

A method for re-attaching the great trochanter to the femur in which the faces to be joined are shaped respectively by matching male and female reamers so that one fits into the other to create an interlocking action. Suitable male and female reamers, preferably of conical or frusto-conical form are described. together with holders for the reamers.

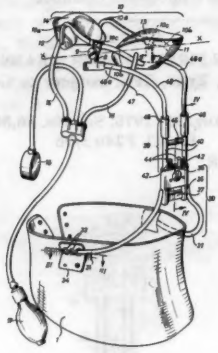


3,667,457

ORTHOPAEDIC APPARATUS FOR TRACTION OF THE SPINAL COLUMN

Giovanni Zumaglini, Turin, Italy, assignor to Officina Medico-Ortopedica Dott. Giovanni Zumaglini, Turin, Italy

Filed Jan. 20, 1970, Ser. No. 4,383
Claims priority, application Italy, Jan. 23, 1969, 50266 A/69
Int. Cl. A61h 1/02
U.S. Cl. 128—75 6 Claims



A truss for placing the spine under traction has a pelvic girdle and an upwardly extending tractor structure at the top of which is connected a head-supporting structure. The lower part of the tractor structure has two diverging curved arms which extend from the patient's back around to the sides of the girdle, where they are pivoted to the girdle. This allows the patient to bend forward. Pneumatic cushions on the support for the head are inflated to adjust the traction force finely. Spring means in the tractor structure act as shock absorbers. Other articulated joints allow the patient to nod and turn his head.

3,667,458

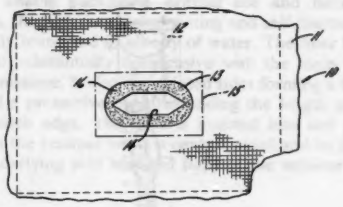
SURGICAL DRAPE SHEET

Kay E. Krebs, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 2, 1970, Ser. No. 15,471
Int. Cl. A61l 15/00
U.S. Cl. 128—132 4 Claims

A disposable surgical drape sheet, of the type having a porous nonwoven fabric sheet for placing over a surgical patient and having a fenestration near its center to expose an operative area, is provided with a continuous film of pressure-sensitive adhesive surrounding the fenestration near its center to expose an operative area. It has a continuous film

of pressure-sensitive adhesive surrounding the fenestration and extending a substantial distance from the periphery. A removable abherent peel strip covering the adhesive area is removed before using the sheet, thereby exposing the adhe-



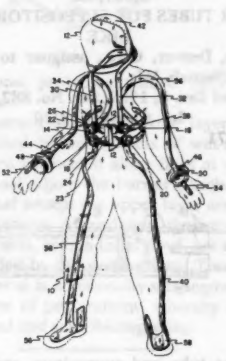
sive and permitting the sheet to be secured around the operative area. Additionally, the adhesive fluid-proofs one side of the drape.

3,667,459

VENTILATION SYSTEM FOR INFLATABLE PRESSURE GARMENTS

George P. Durney, Dover, Del., assignor to ILC Industries, Inc., Dover, Del.

Filed May 8, 1967, Ser. No. 636,855
Int. Cl. A62b 7/14, 18/04
U.S. Cl. 128—142.5 **10 Claims**



An improved ventilation system for a space suit or other inflatable pressure garment assembly, such as used by astronauts and by pilots of high altitude vehicles operating in an environment having low oxygen content and low atmospheric pressures in which the life support gas enters at the helmet and exits through conduits leading from the extremities of both the arms and legs after passing in contact with the entire body of the wearer.

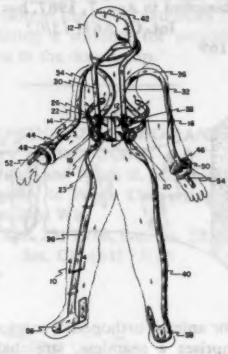
3,667,460

VENTILATION SYSTEM FOR INFLATABLE PRESSURE GARMENTS

Leonard F. Shepard, Dover, Del., assignor to ILC Industries, Inc., Dover, Del.

Filed May 8, 1967, Ser. No. 641,735
Int. Cl. A62b 7/14, 18/04
U.S. Cl. 128—142.5 **7 Claims**

An improved ventilation system for a space suit or other inflatable pressure garment assembly, such as used by astronauts and by pilots of high altitude vehicles operating in an environment having low oxygen content and low atmospheric pressures in which the life support gas enters at the helmet and through ducts at the extremities of the arms



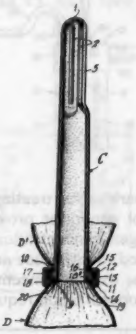
and exits from the garment only through ducts located at the legs after passing over the entire body of the wearer.

3,667,461

DISPOSABLE SYRINGE

Paul A. Zamarra, Lake Road, Far Hills, N.J.

Original application Nov. 5, 1968, Ser. No. 773,455, now Patent No. 3,589,362. Divided and this application Dec. 7, 1970, Ser. No. 95,762
Int. Cl. A61m 1/00
U.S. Cl. 128—232 **5 Claims**



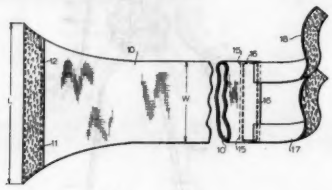
A spray nozzle has spray openings at one end and a flange at its other end, and a bag has folded or pleated portions of its thin plastic wall at the mouth of the bag or around a hole in said wall which has a thickness of the order of from 0.00125 to 0.005 of an inch. Said pleated portions are secured to said flange with a liquid-tight connection by a clamping ring which is outside the bag, grips said pleated portions between itself and said flange and by said snap ring or screw action is quickly attachable to and detachable from said flange which is inside the bag, so that the syringe can be compactly packaged, easily assembled for use and discarded after one use.

3,667,462

ORTHOPEDIC, SURGICAL, ATHLETIC AND ANIMAL BANDAGING

Jacob R. Moon, St. Mary's Road, Box 642, Hillsborough, N.C.

Filed June 4, 1970, Ser. No. 43,446. The portion of the term of the patent subsequent to Apr. 7, 1987, has been disclaimed.
Int. Cl. A61f 13/02
U.S. Cl. 128—169 10 Claims



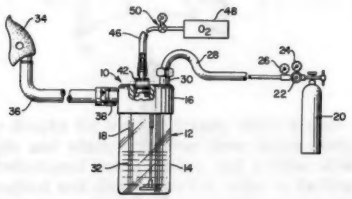
A bandage for animal, orthopedic, surgical and athletic applications comprises a seamless, stretchable, tube knit of synthetic yarn with a fuzzy surface engageable by the hooks of a set of Velcro straps and which provides a bandage the base laps of which can be bonded together so as to minimize slippage during use and the securing strap ends of which are adapted to be hidden.

3,667,463

METHOD AND APPARATUS FOR TREATMENT OF RESPIRATORY DISEASE

David L. Barnes, Springfield, Ohio, assignor to Paul A. Grossi, Carrollton, Ohio, a part interest

Filed Nov. 14, 1969, Ser. No. 876,660
Int. Cl. A61m 15/00
U.S. Cl. 128—194 2 Claims



A method and apparatus for treating respiratory disease is disclosed. An aerosol generator provides an initial aerosol having an initial oxygen concentration and humidity. Adaptor means are provided to introduce additional oxygen to the aerosol to increase the oxygen concentration so as to provide the specific oxygen concentration required by the patient.

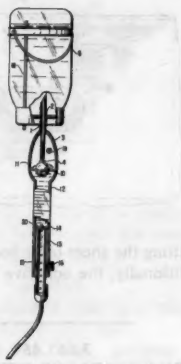
3,667,464

FLUID DISPENSING DEVICE

Lawrence M. Alligood, Jr., 2469 Hunting Valley Drive, Decatur, Ga.

Filed Sept. 4, 1970, Ser. No. 69,531
Int. Cl. A61m 05/16
U.S. Cl. 128—214 C 9 Claims

A fluid flow regulating device for insuring a constant rate of flow therethrough, suitable for use in intravenous therapy, including a constant fluid level chamber with an adjustable piston having a drip orifice in the head thereof seated within and forming the bottom of the chamber. The top portion of the chamber has a fluid receiving tube seated therein. A buoyant body having an upwardly projecting member is located within the chamber and is received within said fluid receiving tube, with at least a portion of the projecting member conforming in shape and size to the orifice of the fluid receiving tube so as to occlude the orifice when in contact. The hydrostatic head pressure is kept constant within



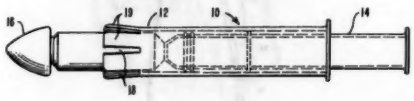
the constant level chamber, thereby providing a constant flow rate which can be adjusted over wide ranges by moving the piston up or down to vary the height of the liquid column in said chamber.

3,667,465

APPLICATOR TUBES FOR SUPPOSITORIES AND THE LIKE

Joseph A. Voss, Denver, Colo., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 8, 1969, Ser. No. 882,841
Int. Cl. A61f 13/20
U.S. Cl. 128—271 17 Claims



An applicator tube and suppository combination is disclosed having a shape and structure such as to permit easy and accurate insertion in a body cavity, such as the rectum, with the applicator comprising a two piece telescoping tubular member for easy ejection of the suppository from the applicator after initial insertion is accomplished. The telescoping tubular members are provided with mating ring configurations which serve to lock the tubular elements in a particular juxtaposition to be maintained prior to use, with the rings being releasable from each other under slight pressure and thereafter serving as guides ans the tubular members are telescoped, one into the other. A novel suppository configuration and means for latching the suppository in place in the applicator prior to use, are also disclosed.

3,667,466

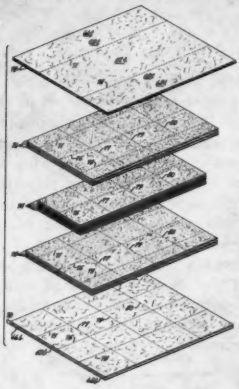
SELF-DISINTEGRATING DIAPER LINER AND RETAINER

Harold J. Ralph, 2002 E. Santa Clara, Santa Ana, Calif.

Filed Sept. 21, 1970, Ser. No. 74,013
Int. Cl. A61f 13/16
U.S. Cl. 128—287 38 Claims

A diaper having a disposable liner comprises a vinyl retainer having a main body panel and side and end flaps

overlying respective side and end edges. Groups of snap fasteners are mounted at extremities of the end flaps to permit the retainer to be adjustably secured about the waist and thighs of a baby. Freely insertable and removable into and from the vinyl retainer is a diaper liner that has adequate strength to enable packaging, normal use and handling. Nevertheless, the liner is self-segmenting and self-disintegrating when fully immersed in a body of water. The liner has a central panel substantially coextensive with the main body panel of the retainer. It also has pleated sides forming a barrier panel and a protective panel extending the length of the liner along each edge. The liner is inserted into and positioned within the retainer with its central panel and its barrier panels underlying side and end flaps of the retainer, but



with the outermost protective panels fully overlying the retainer side flaps.

The liner is formed of a number of layers of absorbent wadding sandwiched between layers of wet-strength paper. All liner layers are perforated along lines at which the sides of the central panel adjoin the barrier panels, and all layers of the central panel except the upper layer are provided with patterns of perforations. Accordingly, the wet-strength layers upon total immersion, as in a toilet bowl, are self-segmenting along lines bounded by the perforations. The lower layer of wet-strength material is additionally self-segmenting along its additional patterns of perforations, whereby the interposed wadding is released and self-disintegrating.

3,667,467

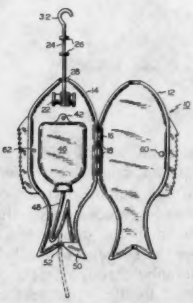
DOUCHE BAG SUPPORT MEANS

Elsworth D. Dory, 4407 Kinmount Road, Lanham, Md.

Filed Nov. 18, 1970, Ser. No. 90,589

Int. Cl. A61m *3/00*

U.S. Cl. 128—227 **6 Claims**



An improved support means for a douche bag and its portable cover assembly in which a hinged cover assembly is supported by a notched string and hook arrangement for bathroom fixtures, and the like, means for supporting the douche bag within the hollowed, contoured cover assembly, openings at the upper and lower portions of the cover assembly, the first for passing the notched string therethrough, the second for passing a hose therethrough, and a receptacle for liquid cup portion in the lower extremity of the cover assembly for containing a solution for providing a wash or sterilization feature to the douche tip.

3,667,468

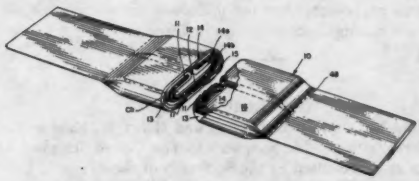
SANITARY NAPKIN AND METHOD AND MEANS OF PRODUCING

Ernst Daniel Nystrand, and Brian H. McIntosh, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Inc., Green Bay, Wis.

Filed Apr. 28, 1970, Ser. No. 32,560

Int. Cl. A61f *13/16*

U.S. Cl. 128—290 **4 Claims**



A sanitary napkin which has a fluff layer sandwiched between carrier layers, the sandwich being C-folded to provide a lined channel on one side of the sandwich which encourages more even, rapid, and complete dispersion of body fluids.

3,667,469

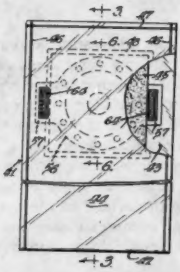
POST-SURGICAL DRAINAGE POUCH

Arthur E. Marsan, 1265 Bellaire Avenue, Denver, Colo.

Filed Dec. 15, 1969, Ser. No. 884,842

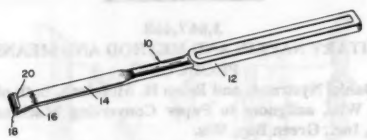
Int. Cl. A61f *5/44*

U.S. Cl. 128—283 **20 Claims**



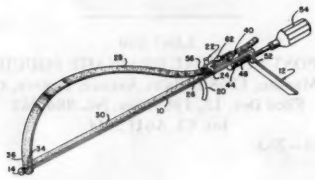
This invention is characterized by a drainage pouch having a bag of plastic film and a gelatinous sealing member for providing a seal between the pouch and the stoma of a patient when the pouch is in use on the patient, and novel construction whereby a single pouch and its sealing member (as an article of manufacture) serves a wide range of stoma sizes, and also whereby the film bag entirely encloses the sealing member before use and serves as the wrapper for the pouch. The invention is further characterized by a method of making the pouch wherein the sealing member is molded to shape and is in operative position within the bag and in which a wall of the film serves as a lining for the mold.

3,667,470
BONE SHAVER AND GROOVER
Frank F. Rubin, 795 Southern Artery, Quincy, Mass.
Continuation of application Ser. No. 660,621, Aug. 15, 1967, now abandoned. This application Apr. 14, 1970, Ser. No. 28,200
Int. Cl. A61b 17/22
U.S. Cl. 128—304 3 Claims



A hand-tool for shaving bone or cartilage has a flat shank slightly bent near its end and then reversely curled with a sharp edge at its extremity. In one form of the tool a narrow extension projects from the middle of the sharp edge, the extension having sharp edges on its three sides.

3,667,471
SURGICAL CLAMP
Donald B. Doty, Silver Spring, and Heinz W. Kugler, College Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army
Filed Aug. 15, 1969, Ser. No. 850,504
Int. Cl. A61b 17/12, 17/08; B65d 63/00
U.S. Cl. 128—325 4 Claims

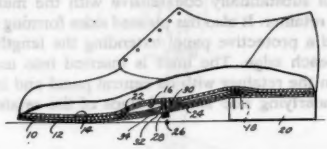


A surgical clamp for application directly to the liver parenchyma which includes a rigid elongated base member for supporting two flexible foam rubber covered blades and a means for the independent adjustment of each blade. A handle is attached to one end of the clamp base for the convenience of the operator in positioning the clamp and manipulating the liver for better exposure. When properly positioned one blade is bent through tension to conform to the shape of the superior surface of the liver, and the other blade is arched through compression against the inferior surface of the liver to achieve tight compression through blade cooperation.

3,667,472
ADHESIVE FOR LIVING TISSUE
Benjamin D. Halpern, Jenkintown, Pa., assignor to Borden, Inc.
Filed Oct. 19, 1961, Ser. No. 155,741
Int. Cl. A61b 17/04
U.S. Cl. 128—334 R 5 Claims

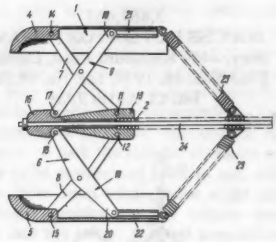
This invention relates to the surgical use of monomeric C_1–C_4 alkyl alpha-cyanoacrylate adhesives for the purpose of rapidly bonding together moist living tissue. The said adhesives are applied to the tissue wherein polymerization takes place in situ and the tissue is firmly bonded together.

3,667,473
ADJUSTABLE ARCH SUPPORT FOR A SHOE
William M. Matteson, 2210 North Street, Nacogdoches, Tex.
Continuation-in-part of application Ser. No. 877,753, Nov. 18, 1969. This application Apr. 27, 1970, Ser. No. 32,327
Int. Cl. A41f 5/14
U.S. Cl. 128—598 6 Claims



A shoe is provided with an adjustable arch support which is constructed to permit ready adjustment of the height and curvature of an arch formed on the insole of the shoe. An adjustment screw means is positioned to be rotated for lifting and lowering at least one arch-forming spring means located under the insole of the shoe. Downward pressure through the adjustment screw means is distributed by a pressure distribution plate positioned above the outsole of the shoe and secured at its rear end to the heel portion of the shoe. The adjustment screw means may be accessible from the bottom, back, or inside of the shoe. A preferred arrangement provides for two arch-forming spring means in a generally side-by-side relationship with separate adjustment screw means for each spring means.

3,667,474
DILATOR FOR PERFORMING MITRAL AND TRICUSPIDAL COMMISSUROTOMY PER ATRIUM CORDIS
Konstantin Vasilievich Lapkin, Sredne-Pervomaiskaya ulitsa, 29, kv. 34, Moscow; Georgy Fedorovich Romanov, ulitsa Gorkogo, 3, kv. 1, Kirovo-Chepetsk; Vladimir Ilich Goloviznin, ulitsa Azina, 3, kv. 29, Kirovo-Chepetsk, and Lev Mikhailovich Popov, Tsentralny proezd, 1, kv. 13, Kirovo-Chepetsk, all of U.S.S.R.
Filed Jan. 5, 1970, Ser. No. 728
Int. Cl. A61m 29/00
U.S. Cl. 128—345 7 Claims



A dilator for performing mitral and tricuspidal commisurotomy per atrium cordis, comprising a working head with jaws and a jaw actuating mechanism, the working head being associated with a hand-operated drive through a flexible base. The working head of the dilator has a relatively rigid portion which enables the surgeon to easily pass the working head with finger guidance through tracts of any curvature, i.e., to utilize the dilator in all current methods of instrumental commissurotomy performed per atrium cordis. The working head of the dilator is distinguished by its high rigidity and strength.

3,667,475

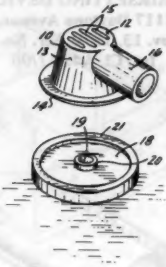
ENDO-TRACHEAL TUBE ADAPTORS FOR USE IN ADMINISTERING GASES

Fred W. Venturelli, and Foy L. Brigman, both of Racine, Wis., assignors to National Equipment Research Inc., Racine, Wis.

Continuation-in-part of application Ser. No. 499,272, Oct. 21, 1965, now abandoned. This application May 10, 1971, Ser. No. 141,940

Int. Cl. A61m *16/00*; F16l *27/10*

U.S. Cl. 128—351 10 Claims



An endo-tracheal tube adaptor including an inexpensive, light weight, transparent open-bottom housing, there being a flexible elastic diaphragm removably stretched over said housing bottom having an expandable opening through which the ends of endo-tracheal tubes of various diameters can be projected to couple the same to a gas supply line connected to said adaptor, the transparency of said housing enabling an attendant to detect an accumulation of phlegm or other foreign matter therein, and the detachable nature of said diaphragm permitting said foreign matter to be readily removed from the housing.

3,667,476

APPARATUS FOR MONITORING BODY TEMPERATURE AND CONTROLLING A HEATING DEVICE TO MAINTAIN A SELECTED TEMPERATURE

Henry Muller, Hatboro, Pa., assignor to Bio/Data Corporation, Norristown, Pa.

Filed Apr. 27, 1970, Ser. No. 31,920

Int. Cl. A61b *6/10*

U.S. Cl. 128—399 7 Claims

A servocircuit measures and controls temperature. A thermistor detects temperature and a controller controls a heating device to maintain a selected temperature in a living organism. The danger of electric shock is removed by using field effect transistors to isolate the thermistor from hazardous voltage currents. Alarm and control circuitry eliminates danger of overheating.

3,667,477

IMPLANTABLE VESICAL STIMULATOR

Jacques G. Susset, Montreal, Quebec, and Robert Nagler, Chomedey, Quebec, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

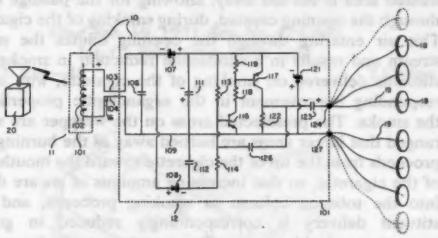
Filed Nov. 17, 1967, Ser. No. 683,944

Claims priority, application Canada, Nov. 25, 1966, 976,490

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 E 3 Claims

A device and method for artificially electrically stimulating the body wall of a bladder by an electromagnetic wave which propagates through the bladder wall and is converted by a receiving mechanism into electrical stimulating pulses which are conducted to the bladder wall. But the receiving mechanism receives all its power from the outside source of electromagnetic energy and since it uses no internal power source for generating the electrical pulses to stimulate the



bladder wall, a substantially permanent receiving mechanism is achieved which requires no free charging of an internal power supply.

3,667,478

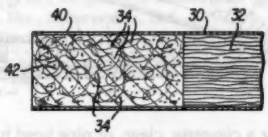
FILTER CIGARETTE INCORPORATING VITAMIN A

Nelson J. Waterbury, Palm Beach, Fla., assignor to F. Barry Haskett, Ocean City, N.J. and Joan Hixon Martin, Washington, D.C., part interest to each

Continuation-in-part of application Ser. No. 666,810, Sept. 11, 1967, now Patent No. 3,525,582, which is a continuation-in-part of application Ser. No. 617,219, Feb. 20, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 590,392, Oct. 28, 1966, now Patent No. 3,339,558. This application July 17, 1969, Ser. No. 842,475. The portion of the term of the patent subsequent to Sept. 5, 1984, has been disclaimed.

Int. Cl. A24d *01/06*; A24b *15/02*

U.S. Cl. 131—9 2 Claims



A cigarette is disclosed for introducing Vitamin A into the mouth and the respiratory tract of a smoker which consists of incorporating in the filter of a filter cigarette a stabilized form of Vitamin A. The Vitamin A is in the form of a stabilized aqueous emulsion of an active Vitamin A or the active esters thereof. The stabilized form of the Vitamin A used is such as to provide stability over long period of storage before use in smoking.

3,667,479

CIGARETTE WITH MODIFIED PAPER WRAPPER

Robert A. Sanford, Prospect; Robert Reiner Johnson, and Thomas Wade Summers, both of Louisville, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jan. 19, 1970, Ser. No. 3,862

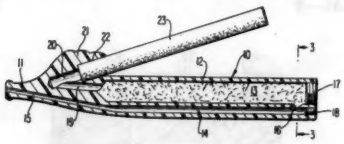
Int. Cl. A24d *1/02*

U.S. Cl. 131—15 8 Claims

An improved cigarette is prepared through use of a modified cigarette paper as a wrapper. The wrapper is

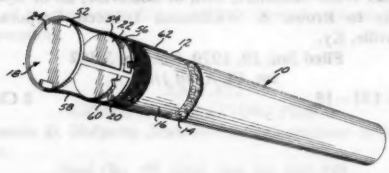
treated in preselected areas with a burn control additive, preferably a strong combustion supporting, oxidizing agent. When the burning coal reaches the area of treatment, the treated area is burned away, allowing for the passage of air through the opening created, during smoking of the cigarette. This air entering through the opening dilutes the smoke stream and results in a substantial reduction in smoke substituents delivered on smoking of the cigarette, with a corresponding improvement in the organoleptic properties of the smoke. The preselected areas on the wrapper are so arranged that larger areas are burned away as the burning coal proceeds from the tip of the cigarette toward the mouthpiece of the cigarette, so that increasing amounts of air are drawn into the tobacco column as smoking proceeds, and substituent delivery is correspondingly reduced in greater amounts as smoking proceeds, so as to provide for a more uniform constituent delivery. The strong, combustion supporting, oxidizing agent may be sodium chlorate, sodium bromate, potassium chlorate, an alkali or alkaline earth metal perchlorate, sodium nitrite, potassium nitrite, ammonium perchlorate or nitric acid. The burn accelerating agent is applied so as to cover 2 to 50 percent of the wrapper and in concentration constitutes ¼ to 8 milligrams per square centimeter of the treated portion.

3,667,480
CIGARETTE HOLDER AND FILTERING UNIT WITH MOUTHPIECE
Stephen Hreno, 29 Dawson Avenue, Clifton, N.J.
Filed Aug. 11, 1970, Ser. No. 62,905
Int. Cl. A24f *01/16*
U.S. Cl. 131—207 **1 Claim**



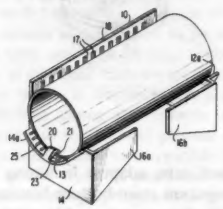
A holder for a cigarette, cigar, or pipe bowl has a socket to receive the article to be smoked and the smoke is caused to circulate through a long filtering passage containing a filtering medium and then through a reversely directed long cooling passage leading through the mouthpiece. The filtering and cooling passages may be reversed. The filtering and cooling passages may extend generally longitudinally of the mouthpiece axis or generally normal thereto.

3,667,481
TOBACCO SMOKE FILTER
Leonard L. Thomas, 14092 Ash Street, Westminster, Calif.
Filed Dec. 5, 1969, Ser. No. 882,675
Int. Cl. A24d *01/04*; **A24f** *07/04, 13/06*
U.S. Cl. 131—261 B **13 Claims**



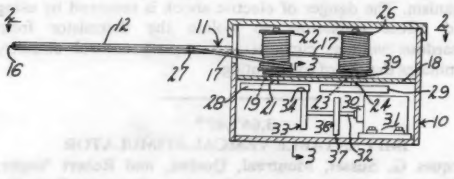
A tobacco smoke filter employing two barriers in the smoke path, each having an opening to form a flow path past the barriers. The first barrier defines a small area flowpath in which smoke and entrained liquids and solids are accelerated and high kinetic energy is imparted to them. The second barrier diverts the smoke but, because of its closeness to the first barrier, the moisture and solids impinge on the latter. A third, downstream barrier marks off a smoke storage space from which smoke is drawn during initial phases of subsequent inhalation to overcome feeling that excessive suction is required to overcome filter impedence. The filter and storage unit is divided into two passageways and is made of plastic and surrounded by paper so that the latter is employed as a repository for moisture and solids and to retain the filter in situ.

3,667,482
HAIRSETTING DEVICE
Justin W. Morgan, 1117 Daytona Avenue, Holly Hill, Fla.
Filed Nov. 13, 1970, Ser. No. 89,394
Int. Cl. A45d *1/00*
U.S. Cl. 132—9 **8 Claims**



A roller lift for effecting straightening of the hair while simultaneously supporting a roller for curling a portion thereof including a clamping arrangement for positively retaining the hair roller in position without movement on the roller lift without the need for auxiliary clips or pins which might come into contact with the hair or render more difficult the use of the roller lift.

3,667,483
DENTAL FLOSS RECIPROCATOR
James B. McCabe, 1900 Deo Dara Drive, Birmingham, Ala.
Filed Dec. 14, 1970, Ser. No. 97,979
Int. Cl. A61c *15/00*
U.S. Cl 132—92 **9 Claims**



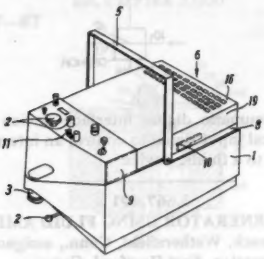
Dental floss reciprocator embodying pair of arms projecting from support frame and spaced from each other to receive teeth therebetween. Guides at outer ends of arms receive and permit relative movement of floss passing from supply reel to take-up reel. Forward and rearward angular movement imparted alternately to reels with forward movement greater than rearward movement to reciprocate and move floss progressively to take-up reel.

3,667,484

PORTABLE MONEY COUNTING MACHINE

Katharina Maria Reis, Bachenauer Str. 19, 7520 Bruchsal, Baden, Germany

Filed Mar. 12, 1970, Ser. No. 19,054
Claims priority, application Germany, Mar. 15, 1969, G 69 10 464
Int. Cl. G07d 9/00
U.S. Cl. 133—8 R 3 Claims



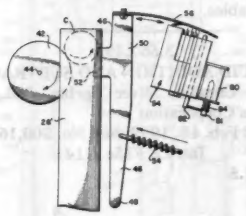
Money counting apparatus comprises a housing having means for counting and sorting coins located therein, a rotary disk is mounted on top of the housing and is adapted to centrifugally separate and feed coins. A cover member is mounted above the disk. The housing and cover member are provided with cooperating interlocking means for selectively securing the cover on the housing in a first position enclosing the disk, and a second position inverted thereto to form a feed tray for the disk.

3,667,485

FARE BOX WITH BELT CONVEYOR AND COIN SIZE DETECTOR

William J. Sesko, 12942 Highway 3, Bremerton, Wash.

Filed Oct. 21, 1969, Ser. No. 868,114
Int. Cl. G07d 3/00
U.S. Cl. 133—8 36 Claims



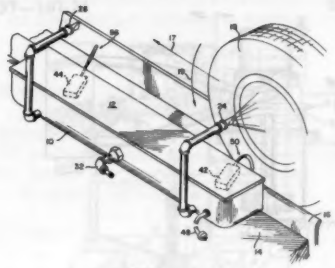
Fare box in which belt conveyors transport coins and dollar bills past an inspection window to a vault. The coins are sized, indicated audibly, and registered. Both sides of dollar bills may be inspected by transillumination or by automatic reversal of the bills in transit. The coin size detector comprises a multiple-contact switch employing an actuator arm driven in a first direction by the coins and in the opposite direction by a spring, the length of the stroke of the actuator arm in the first direction determining which contacts are transferred when the arm moves in the reverse direction.

3,667,486

AUTOMATIC WHEEL CLEANING APPARATUS

Joseph J. Cole, and Charles A. Bookwalter, II, both of c/o Nora Plaza Car Wash, 1300 E. 86th Street, Indianapolis, Ind.

Filed Feb. 19, 1971, Ser. No. 116,809
Int. Cl. B60s 3/04; B08b 3/04
U.S. Cl. 134—45 7 Claims



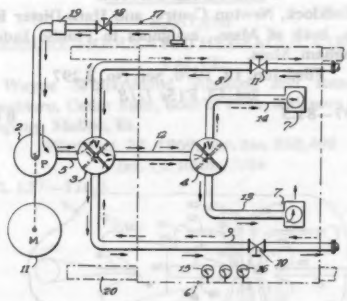
Wheel cleaning apparatus for automatic vehicle washing installations in which steam is applied to a wheel while the wheel is in contact with a projecting wand. Contact between the wand and a passing wheel closes an electrical circuit and actuates a solenoid which opens a valve to permit steam to pass from a source to and through the steam outlet. When the wheel passes beyond the wand the electrical circuit is broken and the steam control valve closes.

3,667,487

INTEGRATED CHEMICAL CLEANING APPARATUS

Delbert L. Schoenbeck, Clarendon Hill, and Reece Kincaid, Crete, both of Ill., assignors to Richardson Chemical Cleaning Service, Inc., Schererville, Ind.

Filed Dec. 11, 1970, Ser. No. 97,160
Int. Cl. B08b 9/00, 13/00
U.S. Cl. 134—108 4 Claims



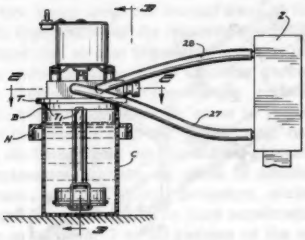
An integral chemical cleaning apparatus for supplying and recirculating compositions used in the process of removing scale, rust, grease and dirt coatings from internal metallic surfaces of closed industrial equipment where the stages of pickling, passivating and flushing are performed consecutively without change-over to separate devices for each of such stages of the process. The apparatus comprises a circulating pump forcing fluids from a supply source to valve means capable of directing flow in either of two directions for reverse cleaning and flushing and circulation back to said valve and on through a second valve means for discharge into one of a plurality of filters for removal of insoluble particles wherein said filtrate is collected in said supply source for recirculation into the system.

3,667,488

DEVICE FOR REMOVING DIRT AND CORROSION FROM HEAT EXCHANGER CORES

Harold W. Paggen, P.O. Box 381, Hopkins, Mich.

Filed Feb. 17, 1970, Ser. No. 12,114
Int. Cl. B08b 3/08, 9/02
U.S. Cl. 134—169 A 3 Claims



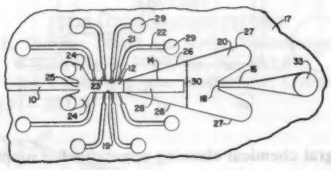
The compact portable device for flushing out and removing dirt and corrosion from the cores of heat exchangers employs an upstanding open top container for the liquid having a bottom of substantial area to constitute a base. A multifunctional mounting and top is employed with a portion thereof to close the container and with a portion thereof constituting passages and support and securing means for first a depending immersion-type motor-driven pump and secondly a valving mechanism preferably constructed of dielectric material which is affixed to the multi-functional top between the same and the bottom of the pump motor. The valving mechanism has passages for alternately connecting the discharge of the pump with either of two passages to provide for reversing flow of the liquid under pressure through the heat exchanger core with attendant recirculation through the container.

3,667,489

PURE FLUID DEVICE

Paul M. Blaiklock, Newton Centre, and Hans-Dieter Kinner, Duxbury, both of Mass., assignors to Fluidic Industries, Inc., Hingham, Mass.

Filed Jan. 12, 1970, Ser. No. 2,297
Int. Cl. F15c 1/18
U.S. Cl. 137—81.5 8 Claims



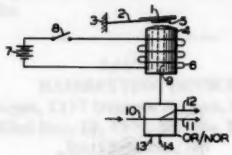
A pure fluid device for providing efficient digital operation. A laminar input stream is caused to interact with one or more control streams within a confined interaction chamber to provide a binary output pressure whose level depends upon the laminar or turbulent condition of flow within the chamber. The invention provides extremely rapid switching in a precisely controllable manner. The invention is also operable to provide controllable proportional amplification by producing an output pressure of a magnitude variable in response to control pressure variation.

3,667,490

ELECTRO-PNEUMATIC DIGITAL INTERFACE

Clifford W. Allen, Lexington, Ky., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Apr. 28, 1970, Ser. No. 32,697
Int. Cl. F15c 3/08; F16k 31/02
U.S. Cl. 137—81.5 3 Claims



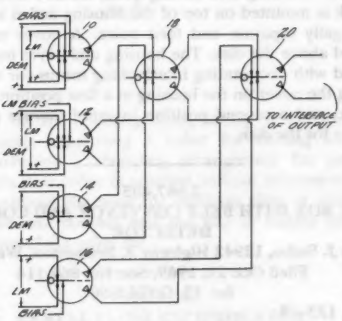
An electro-pneumatic digital interface device utilizing a low level electrical input signal to control an interrupter vane in a control port to a fluidic device.

3,667,491

FUNCTION GENERATOR USING FLUID AMPLIFIERS

Thad M. Hasbrouck, Wethersfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 4, 1970, Ser. No. 34,287
Int. Cl. F15c 1/14, 4/00
U.S. Cl. 137—81.5 4 Claims



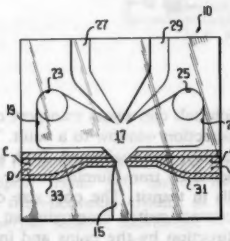
The function generator generates a nonlinear open loop schedule summing by a fluid amplifier the outputs of two or more fluid amplifiers that are both responsive to two or more independent variables.

3,667,492

PURE FLUID ADDITION AND SUBTRACTION

Carmine V. Di Camillo, Silver Spring, Md., assignor to Bowles Fluidics Corporation

Filed Feb. 18, 1969, Ser. No. 800,163
Int. Cl. F15c 1/14
U.S. Cl. 137—81.5 7 Claims



Accurate analog addition and subtraction are performed in a proportional fluidic amplifier of the stream interaction type

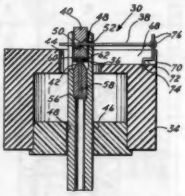
in which a pair of control nozzles are superposed, one atop the other, so as to issue their respective control streams against the same point in the power stream flow path.

3,667,493

FLOAT VALVE FOK AIR LINE LUBRICATORS

Barry E. Lindstrom, Englewood, and Donald A. Robb, Denver, Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Filed Dec. 28, 1970, Ser. No. 101,966
Int. Cl. F16k *33/00*
U.S. Cl. 137—87 **10 Claims**



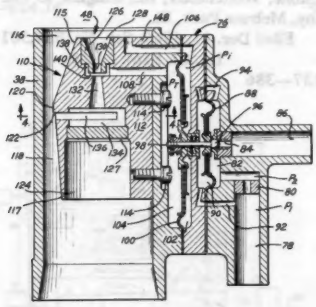
This invention relates to a float-actuated shut-off valve for use in the pressurized reservoir of an air line lubricator to cooperate with the latter upon a drop in the oil level below a predetermined point so as to automatically open an air line to the air pressure within said reservoir and use the resulting pressurized line to either actuate a warning device or shut down the pneumatic equipment dependent upon the system for lubrication.

3,667,494

MASS AIR FLOW MEASURING MEANS

Elmer A. Haase, 22905 Edison Road, South Bend, Ind.

Original application Oct. 9, 1967, Ser. No. 673,815, now Patent No. 3,549,815, dated Dec. 22, 1970. Divided and this application Aug. 11, 1970, Ser. No. 62,808
Int. Cl. G01f *1/00*
U.S. Cl. 137—100 **5 Claims**



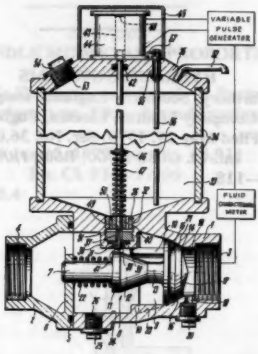
A mass air flow sensitive fuel control for controlling fuel to a multiple cylinder internal combustion engine wherein the fuel control apparatus includes mass air flow sensing means such as a high gain venturi disposed in the air induction passage for measuring the mass air flow to a single engine cylinder and a fuel control valve actuated as a function of the venturi air pressure output for controlling fuel flow to all of the engine cylinders as a function of the mass air flow to the one engine cylinder.

3,667,495

PROPORTIONING DEVICE, ESPECIALLY FOR WATER TREATMENT SYSTEMS

Hansjorg Schuler, Waldrems, and Hartmut Dopslaff, Winnenden, both of Germany, assignors to Julius Dopslaff KG, Winnenden, Germany

Filed Mar. 20, 1970, Ser. No. 21,460
Claims priority, application Sweden, Feb. 16, 1970, 1914/70
Int. Cl. G05d *11/035, 11/13*
U.S. Cl. 137—101.21 **38 Claims**



A proportioning device for the admixture of an additive fluid into a fluid medium flowing in a pipe or conduit. The flow rate of the fluid medium is measured and the pump which introduces the additive fluid is controlled in response to the measured flow rate. The measuring system includes a body disposed to be moved linearly against the force of a spring by the fluid medium passing thereby. In one embodiment, this body has a surface which varies along its length and the additive fluid pump has a plunger in contact with this surface. As the body is moved by the varying flow rates of the fluid medium, the effective plunging stroke of the pump is controlled. In another embodiment, a magnetic field is used to detect changes in the position of the body.

3,667,496

PRESSURE-MODULATED HYDRAULIC CONTROL VALVE

John Wayne Schletzbaum, Hudson, and Reno Antonio Rodeghiero, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 22, 1969, Ser. No. 868,498
Int. Cl. B60t *15/04*
U.S. Cl. 137—116.3 **3 Claims**

A pressure-modulated hydraulic control valve is provided for controlling fluid flow to engage and disengage a dif-

ferential lock. A manual actuator acts through a modulating spring to shift a spool valve to selectively establish conditions in the control valve for engaging and disengaging the differential lock and the manual actuator includes a length adjustable link which may be adjusted without disassembly to change the modulating force to desired values. A check valve in the pressure port normally prevents flow to the spool valve when the lock is disengaged and a pin extends from the check valve into the valve bore and is engaged and moved by a ramp on the spool valve to unseat the check valve when the spool valve is shifted to establish the condition for engaging the lock.

3,667,497

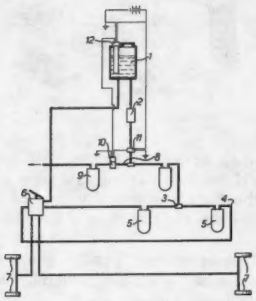
HYDRAULIC SYSTEMS

George K. Farmery, Scothern, England, assignor to Clayton Dewandre Company Limited, Lincoln, England

Filed May 11, 1970, Ser. No. 36,002

Int. Cl. G05d *11/00*; B60q *1/00*

U.S. Cl. 137—118 **5 Claims**



A hydrodynamic type hydraulic system for actuating the brakes and other auxiliary devices on a motor vehicle includes a solenoid-operated valve for controlling the flow of pressure fluid to the auxiliary devices, said valve being controlled by means responsive to the pressure at the output side of the pump and additionally by means responsive to fluid level in the system reservoir.

3,667,498

WATER SPRINKLING SYSTEM

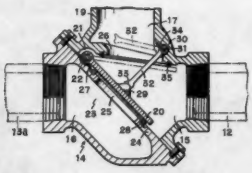
Shuzo Mizuno, Tokyo, Japan, assignor to Sanko Engineering Company, Limited, Tokyo, Japan

Filed Dec. 29, 1969, Ser. No. 888,319

Claims priority, application Japan, Dec. 26, 1968, 43/96273

Int. Cl. A01g *25/00*; B05b *9/00*

U.S. Cl. 137—119 **19 Claims**



A water sprinkling system comprising a main supply conduit and a plurality of branch conduits. Each branch conduit is connected to the main supply conduit by a valve which is constructed to switch the flow of fluid from the branch conduit to the main conduit by cutting off the fluid pressure for a selected time interval. Each valve comprises a pivoted gate which is biased to close the branch conduit and open the main conduit. The gate is pressed by the fluid pressure to close flow to the main conduit and allow flow to the branch. When the supply of fluid is cut off, the gate swings to close the branch and open the main conduit.

3,667,499

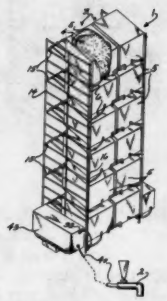
LIQUID DISPENSING SYSTEM

Donald L. Branton, and James R. Mowery, both of Delavan, Wis., assignors to Sta-Rite Industries, Inc., Delavan, Wis.

Filed May 4, 1970, Ser. No. 34,372

Int. Cl. B23b *41/08*; F16e *41/04*

U.S. Cl. 137—318 **19 Claims**



The disclosed liquid dispensing system contemplates a liquid source comprising a plurality of containers arranged in a vertical column. Each of the containers is provided with an outlet means adjacent to the bottom thereof and which may be coupled to a vertically extending manifold tube. The liquid in the containers flows by gravity from the containers to a pump connected to the manifold tube. The pump is operated as required to force the liquid into a pressure accumulator tank from which the liquid is drawn at the point of use.

3,667,500

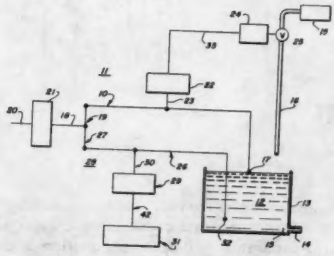
LIQUID LEVEL CONTROLLER

Leslie F. Stone, Westchester, Ill., assignor to The Richardson Company, Melrose Park, Ill.

Filed Dec. 11, 1969, Ser. No. 884,301

Int. Cl. F16k *21/18*

U.S. Cl. 137—386 **5 Claims**

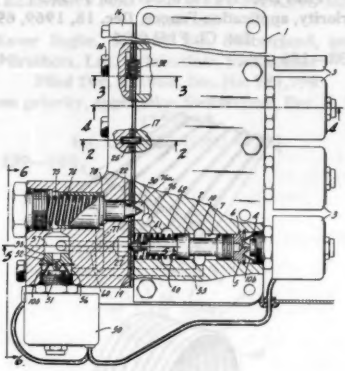


An apparatus for controlling liquid levels for viscous liquids such as printing ink utilizing pneumatic probes and responsive liquid regulating means.

3,667,501
SELECTOR VALVE ASSEMBLY WITH MECHANICAL LATCH

Joseph B. Snoy, and Bradford K. Shull, both of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Dec. 30, 1970, Ser. No. 102,780
Int. Cl. F16k *11/20*
U.S. Cl. 137—612.1 11 Claims

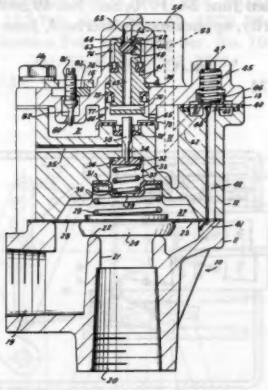


A selector valve assembly for use with power shift transmissions to select various operating speed ranges, and of the type having a plurality of shiftable hydraulic spools. The assembly includes a mechanical latch plate for holding the selected spools in an extended, operative position. A neutral piston is provided for engagement with the latch plate to urge the latter to the piston releasing position to thereby disengage the spools.

3,667,502
SELF-RECYCLING ACTUATOR AND VALVE INCORPORATING IT

Noel A. Otto, Whippany, N.J., assignor to Automatic Switch Co.

Filed Mar. 19, 1970, Ser. No. 24,916
Int. Cl. F16k *31/383*, *31/385*
U.S. Cl. 137—624.14 9 Claims

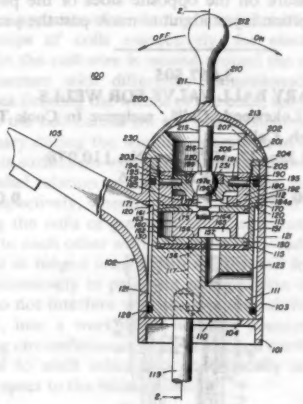


A self-recycling actuator operated by a source of fluid pressure is used to control the operation of a valve. The valve has a main valve member whose position is controlled by a pilot valve adapted to vent the high pressure side of the main valve member. The self-recycling actuator controls the pilot valve and is operated by the high pressure fluid from the inlet of the main valve. High pressure fluid brought to the inlet of the self-recycling actuator displaces a plunger member thereby opening the pilot valve and hence the main valve. At the same time, high pressure fluid enters a recycling chamber. As pressure builds up in the recycling chamber, the plunger is returned to its initial position. Vent means reduces the pressure in the recycling chamber thereby initiating a new cycle.

3,667,503
SINGLE-HANDLE MIXING AND PROPORTIONING VALVE

Gerald J. Farrell, Elmhurst, and Frank J. Bartos, Chicago, both of Ill., assignors to Elkay Manufacturing Company, Broadview, Ill.

Filed June 5, 1970, Ser. No. 43,911
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.4 21 Claims



There are disclosed two embodiments of a water faucet mixing and proportioning valve including a housing defining a valve seat having hot and cold water inlet ports and an outlet port, a valve plate having a mixing cavity cooperating with the inlet and outlet ports to control the flow therethrough, a bearing mounted on the housing for pivotal movement about an axis, and a lever pivotally mounted on the bearing and having a handle at one end and coupled at the other end to the valve plate for movement thereof, the lever being limited to pivotal movement with the bearing about the axis for accommodating curvilinear hand movement and rectilinear valve plate movement between full-off and full-on positions and being limited to pivotal movement with respect to the bearing in a direction parallel to the axis for accommodating rectilinear movement of the valve plate between full-hot and full-cold positions; seals and hydraulic seal loading means are also provided.

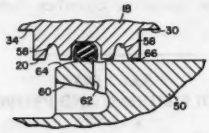
3,667,504
ZERO-LEAKAGE SPOOL VALVE

Richard Arthur Wittren; Raymond Richard Meysenburg, both of Cedar Falls, and Robert Hugh Tweedy, Brookfield, all of Wis., assignors to Deere & Company, Moline, Ill.

Filed Dec. 28, 1970, Ser. No. 101,917
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.69 13 Claims

A plurality of O-ring packings are mounted between ports in a spool valve bore. A valve spool is selectively shiftable in

the bore for routing fluid among the ports and includes a plurality of lands, each of which, when located between a pair of ports, is seatingly engaged by one of the packings for preventing leakage between the pair of ports. Under normal operating conditions, the fluid pressures respectively existing at the pair of ports are different and this pressure differential exists across the packing. In order to prevent the packing



from being dislodged from its mounting groove by fluid pressure, when the land portion is moved past the packing, a passage means located in the valve spool connects the fluid pressure at the port, away from which the land portion is moving, to the side of the packing remote from the port, to balance the pressure on the opposite sides of the packing, when the land portion is just about to move past the packing.

3,667,505

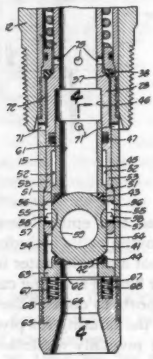
ROTARY BALL VALVE FOR WELLS

Gary A. Radig, Lakewood, Calif., assignor to Cook Testing Co., Long Beach, Calif.

Filed Jan. 27, 1971, Ser. No. 110,078

Int. Cl. F16k *11/16*

U.S. Cl. 137—630.14 **9 Claims**



A subsurface safety valve for a well employs a rotary ball valve assembly which includes a ball member interposed between annular seats positioned within the housing. The upper seat is mounted on a carrier having flange portions engaging under a shoulder within the housing. A lower seat is spring-loaded against the spherical surface of the ball member. Integral offset aligned pins on the ball member are engaged by arms on an actuator mounted for axial movement within the housing, the arms straddling the ball member and having laterally opening slots which engage the pins. The ball member and the flange portion of the carrier have laterally spaced parallel vertical surfaces which are received between similar surfaces on the actuator arms. A bypass valve is provided between the actuator and the housing so that fluid may pass through housing ports and actuator ports to equalize pressure across the ball member during the first part of movement of the actuator, the subsequent part of the movement serving to move the ball member between open and closed positions. A spring moves the actuator axially in one direction and a hydraulic cylinder assembly acts to move it in the other direction. Pressure in the hydraulic cylinder is obtained from a control line extending to the surface.

3,667,506

CORRUGATED METAL TUBE FOR AN EXTERNAL CONDUCTOR OR SHEATH OF AN ELECTRIC CABLE

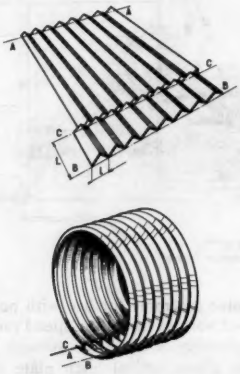
Robert Jocteur, Lyon, France, assignor to Cable De Lyon Alsacienne, Lyon, France

Filed Dec. 17, 1970, Ser. No. 99,205

Claims priority, application France, Dec. 18, 1969, 6943940

Int. Cl. F16l *9/06*

U.S. Cl. 138—156 **4 Claims**



A corrugated metal strip is curved and transversely overlapped to form a tube, the corrugation being inclined relative to the transverse axis such that the edges have their corrugations axially offset by half a corrugation and the external zone in turn is axially offset by one half a corrugation to define an edge abutment determining the exact diameter of the completed tube.

3,667,507

DOUBLE-LIFT DOBBY

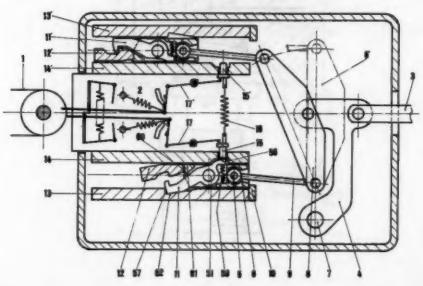
Joseph Palau, Duingt, Haute-Savoie, and Jacques de Germond, Menthon-St. Bernard, both of France, assignors to Staubli Ltd., Horgen-Zurich, Switzerland

Filed June 24, 1970, Ser. No. 49,308

Claims priority, application Switzerland, June 25, 1969, 9705/69

Int. Cl. D03c *1/06*

U.S. Cl. 139—71 **11 Claims**



A double lift dobby with a balance for each heald and with a draw hook for each end of the balance. The dobby also in-

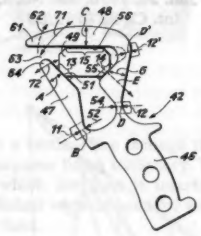
cludes a draw knife slidably arranged in the same guideway with the draw hook so that, whenever the draw hook is hooked in or engages the draw knife, both the draw hook and draw knife are guided within the single guideway so that no relative motion takes place between the draw knife and the draw hook during the whole of their commonly executed movement.

3,667,508

GUIDE ELEMENT FOR THE WEFT PICKING MEANS IN A LOOM

Anton Xaver Inglin, Zuchwil SO, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Dec. 6, 1968, Ser. No. 781,799
Claims priority, application Switzerland, Dec. 8, 1967, 17279/67
Int. Cl. D03d *49/60*, *47/00*
U.S. Cl. 139—188 **8 Claims**



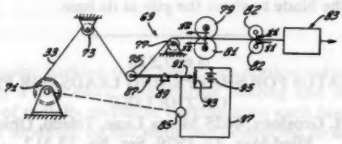
The weft picking means is guided through the shed through a plurality of spaced guide elements. Each guide element is constructed with a foot which secures the guide element to the loom frame and a pair of jaws which define a guide path for the picking means. Either the jaws are formed with a reduced cross-section between the picking means guide surfaces and foot or the foot is formed with a reduced cross-section adjacent the jaws so as to permit resilient deflection of the jaws under canting forces of the picking means.

3,667,509

WIRE FABRIC AND APPARATUS AND METHOD FOR MAKING SAME

Herbert E. Rohrbacher, Whittier, Calif., assignor to Bergandi Manufacturing Company, Inc., El Monte, Calif.

Original application Aug. 4, 1967, Ser. No. 658,530, now Patent No. 3,512,760, dated May 19, 1970. Divided and this application Feb. 12, 1970, Ser. No. 10,885
Int. Cl. B21f *23/00*, *27/04*
U.S. Cl. 140—3 C **8 Claims**



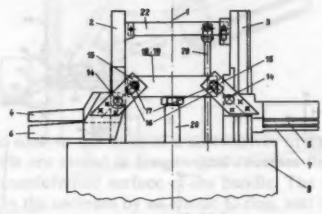
This disclosure describes a wire fabric of open construction including a plurality of wires each of which is formed into a coil. The several coils are interlinked and secured together to form a wire fabric of open construction. The wire is of non-circular cross section and provides a wire fabric of increased strength.

3,667,510

APPARATUS FOR WINDING COILS FOR ELECTRICAL MACHINES

Klaus-Dieter Sattler, 24 Lubeck, Luisenstrasse 3C, Germany

Filed Feb. 24, 1970, Ser. No. 13,336
Claims priority, application Germany, Mar. 7, 1969, P 19 11 551.6-32
Int. Cl. B21f *3/04*
U.S. Cl. 140—92.2 **9 Claims**



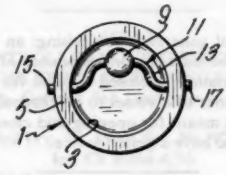
In an apparatus for winding concentrically disposed coils, or groups of coils respectively, for electrical machines, wherein the coil wire is wound around the outer surfaces of coil carriers with differently dimensioned outer circumferences defining the widths of the coils, the invention resides in that the coil carrier for the coil of smallest width remains stationary during the winding operation, as is known per se, while its surface on which the wire is to be wound is arranged in parallel relation to the axis of winding, or the axis of the coil respectively, wherein the remaining coil carriers for supporting the coils of greater widths are arranged in pairs opposite to each other with respect to the winding axis, and are formed as hinged arms which are pivoted for each width of coil successively in pairs out of a position of rest, in which they do not interfere with the winding of the preceding coil carrier, into a working or winding position, in which the winding circumferences of all of the coil carriers are disposed parallel to each other and eccentrically or concentrically with respect to the winding axis.

3,667,511

DEVICE FOR CRACKING THE SHELLS OF NUTS

Anton F. Van Der Wey, 350 Bourbeau Street, Asbestos, Quebec, Canada

Filed June 1, 1970, Ser. No. 41,952
Claims priority, application Canada, Apr. 25, 1969, 060,391
Int. Cl. A23n *5/02*
U.S. Cl. 146—14 **3 Claims**

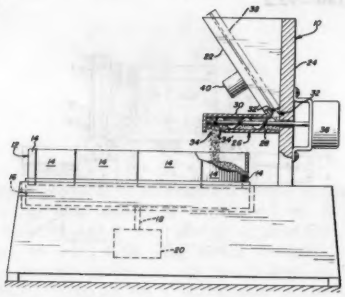


A device for cracking the shells of edible nuts comprising a body member having a cavity for receiving a nut. An impactor is resiliently connected to the body member. The impactor is manually pulled away from the body member against the force exerted by its resilient connection, and then released, to be projected by the resilient connection against a nut in the cavity.

3,667,512
POWDER SAMPLER

Meryl R. Jackson, Schaumburg, Ill., assignor to Freeman Laboratories, Inc., Rosemont, Ill.

Filed Oct. 21, 1970, Ser. No. 82,686
Int. Cl. B65b *43/50*
U.S. Cl. 141—130 7 Claims

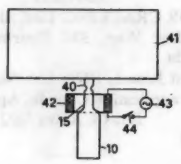


A sampling device for obtaining representative samples of material from a bulk quantity thereof includes a plurality of rotating sample containers which are sequentially and repetitively fed by a flow stream of the material. The flow stream eminates from a hopper. The mechanism controls the flow rate of the flow stream to insure representativeness and statistical validity of the samples.

3,667,513
GENERATION OF ALKALI METAL VAPORS

Paolo Della Porta; Mario Zucchinelli, and Carlo Emili, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed May 20, 1970, Ser. No. 39,119
Claims priority, application Italy, May 24, 1969, 17303 A/69
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—311 13 Claims



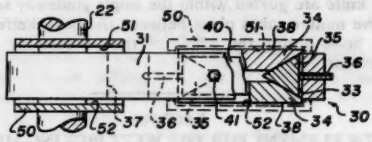
An alkali metal generator comprising: an evacuated container; at least one heat-responsive source of an alkali metal vapor in the container; a closed conduit for connecting the evacuated container to a vessel to be charged with the alkali metal vapor; and means for opening said closed conduit. The container can also have a getter device.

3,667,514
GUIDING CIRCULAR SAWS

Oliver E. Krog, Richmond, British Columbia, Canada, assignor to Canadian Forest Products Ltd., British Columbia, Canada

Filed Jan. 22, 1970, Ser. No. 4,817
Claims priority, application Canada, Jan. 5, 1970, 071,340
Int. Cl. B27b *5/34*
U.S. Cl. 143—37 R 8 Claims

A guide for a circular saw comprising a pair of guide elements each with a guide surface for guiding the saw or saws, the spacing between the surfaces being adjustable either by

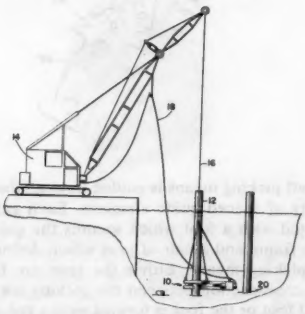


cams or wedges movable between the two elements.

3,667,515
PILE CUTTING DEVICE

Robert J. Corey, Lowell, Mass., assignor to Corey's Steeplejacks, Inc., Lowell, Mass.

Filed Jan. 26, 1970, Ser. No. 5,511
Int. Cl. B27b *23/00*
U.S. Cl. 143—34 1 Claim



A pile cutting device comprising a base having a guide adapted for reception of a pile, the base being adapted for reciprocal movement with respect to the pile, connectors affixed to the base for suspending the base in a substantially horizontal plane, a blade having a pair of opposite extremities, one of the extremities being pivotably mounted to the base, an actuator having a fixed member and a movable member, the fixed member being pivoted to the base and the movable member being pivotably mounted to the other extremity of the blade, the blade being swept across the guide when the actuator is engaged and being retracted away from the guide when the actuator is disengaged. When the pile cutter is lowered to the base of a pile, the guide being positioned about the pile for restricting the lateral movement of the base with respect to the pile, the actuator is engaged causing the blade to shear the pile at its base.

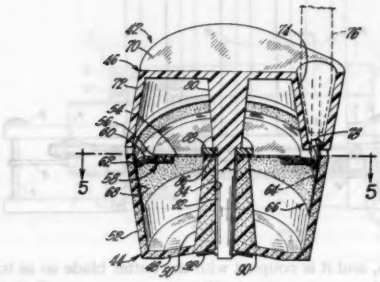
3,667,516
APPARATUS FOR SHARPENING LEADS FOR PENCILS OR THE LIKE

Robert M. Grosjean, 4625 Merry Lane, Toledo, Ohio

Filed Mar. 27, 1970, Ser. No. 23,312
Int. Cl. B43l *23/00*
U.S. Cl. 144—28.11 19 Claims

A disposable, expendable sharpener for leads and a drive for manipulating and rotating the sharpener are provided. The sharpener includes a bottom wall, side wall, and central truncated cone or hub which are integrally formed of foamed plastic material. A top is provided for the sharpener with an opening for access to a truncated conical abrasive surface in the sharpener. A flexible lip extends from an edge of the top toward the abrasive surface to urge a lead inserted in the

opening against the surface. The lip tends to enclose the sharpener to restrict spreading of graphite powder therefrom and also wipes graphite powder from the lead when being sharpened and when removed. The drive for the sharpener includes a gear arrangement which causes the sharpener to move in a circular path and, at the same time, to rotate about



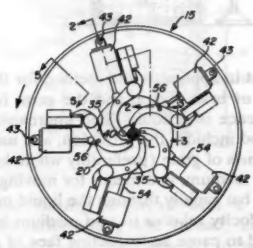
its own axis, with a vertical line through the conical abrasive surface of the sharpener being stationary. This line represents the position at which the lead is inserted for sharpening, which is accomplished without need for rotating or otherwise manipulating the lead.

3,667,517

LOG BARKER

Allan M. Bentley, and Elmer Christensen, both of Everett, Wash., assignors to The Black Clawson Company, Middletown, Ohio

Filed Sept. 2, 1970, Ser. No. 69,038
Int. Cl. B27l *1/00*
U.S. Cl. 144—208 E **13 Claims**



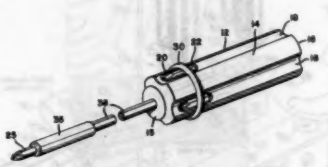
An annular barking rotor has a hub portion rotatably supported by a concentric anti-friction bearing and supports a plurality of radially pivotable barking arms each biased by an air motor mounted on the rotor and connected to an annular air chamber within the rotor. Air is supplied to the chamber and motors through a set of sliding air shoes, and the pressure of the air is controlled by a series of pilot operated valves, relay exhaust valves and regulating valves actuated by controls located at a remote console. Pilot operated diaphragm exhaust valves are carried by the rotor for connecting the air chamber directly to atmosphere and are actuated by a pulse of pilot air supplied through another air shoe connected to the main air supply through a pilot operated valve controlled by a valve also located at the console.

3,667,518

SCREWDRIVER WITH BIT STORING HANDLE

George B. Stillwagon, Jr., Dayton, Ohio, assignor to Gardner-Denver Company, Dayton, Ohio

Filed Apr. 30, 1970, Ser. No. 33,355
Int. Cl. B25g *1/08*
U.S. Cl. 145—62 **3 Claims**



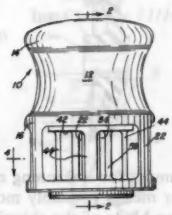
A hand tool, in the form of a screwdriver in which a series of tool bits are stored in longitudinal recesses formed in the outer circumferential surface of the handle. The tool bits are retained in the recesses by an elastic O-ring, and may be easily removed by rolling back the O-ring for snap fitting into the shank portion of the tool.

3,667,519

FOOD CHOPPER

Laurine R. Shadduck, 6220 Byron Street, Rosemont, Ill.

Filed Apr. 9, 1970, Ser. No. 26,952
Int. Cl. A47j *43/00*; B26b *3/04*
U.S. Cl. 146—160 **3 Claims**



A hand-operated food chopper has concentric cylindrical cutting blades which have large openings in their vertical walls to permit flow of chopped materials therethrough and prevent clogging. Spring-actuated motion of one or more of the blades is also provided to further insure against clogging.

3,667,520

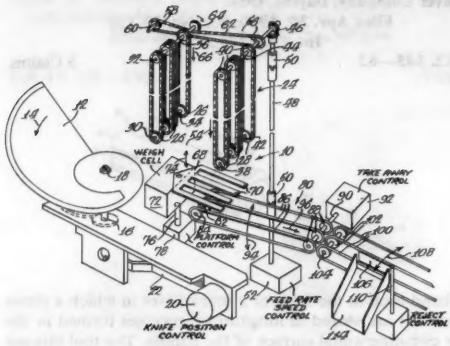
WEIGHT CONTROLLED SLICING SYSTEM INCLUDING GROSS ERROR DETECTING MEANS

Keith E. Flesch, Garrett, Ind., assignor to Peter Eckrich & Sons, Inc.

Filed Dec. 14, 1970, Ser. No. 97,590
Int. Cl. B26d *4/56*
U.S. Cl. 146—94 R **10 Claims**

A slicer control system of the type for use in slicing operations wherein a predetermined number of slices are cut from a length of material and are intended to have a predetermined weight. The exemplary embodiment employs a slice receiver which receives slices as they are cut and a take-away conveyor for removing slices from the slice receiver after a predetermined number of slices are cut. The invention further includes a weight monitoring system for comparing the weight of the slices cut against a predetermined standard to prematurely actuate the take-away conveyor when a

predetermined error exists even though the predetermined number of slices have not yet been cut to minimize the



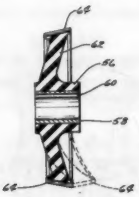
number of groups of slices having gross errors and ultimately require rejection for weight deviation from a standard.

3,667,521

HOLD DOWN ATTACHMENT FOR A SKINNING MACHINE

Donald L. Beasley, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Aug. 18, 1969, Ser. No. 850,960
Int. Cl. A22c *17/12*
U.S. Cl. 146—130 **12 Claims**



A hold down attachment for a skinning machine comprising a hold down roller means rotatably mounted above the feed roller and skinning blade of the skinning machine. The hold down roller means is comprised of a plurality of spaced apart resilient rollers mounted on a driven shaft and adapted to engage the slab being skinned. The configuration of the resilient rollers is such that the slab is simultaneously stretched in two lateral directions as the slab is being skinned which maintains the bottom of the slab in a straight or horizontal condition as it engages the skinning blade. A modified form of the hold down roller means is also disclosed and comprises a plurality of spaced apart rollers, each of which are comprised of four spring loaded shoes extending outwardly from a central hub portion. The spring loaded shoes engage the slab being skinned and simultaneously stretch the slab in two lateral directions as the slab is being skinned to maintain the bottom of the slab in a straight or horizontal condition to achieve the same results as the first described embodiment.

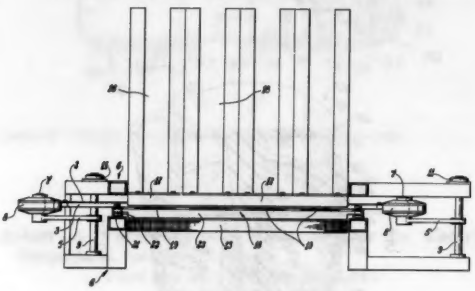
3,667,522

SLICING APPARATUS

David W. Bingham, Brighton, Victoria, Australia, assignor to Pitters Proprietary Limited, Moorabbin, Victoria, Australia

Filed Jan. 28, 1970, Ser. No. 6,525
Claims priority, application Australia, Feb. 12, 1969, 50353/69
Int. Cl. B26d *4/22, 5/14*
U.S. Cl. 146—131 **11 Claims**

Cutting or slicing apparatus having a cutter blade movably mounted on a frame so as to be oscillatable along an arcuate path of travel, and gauge means adapted to correctly locate material to be cut by the cutter blade and which is also movably mounted on the aforementioned frame. The gauge means is positioned in advance of the cutting edge of the blade to allow passage of cut material to a conveyor located



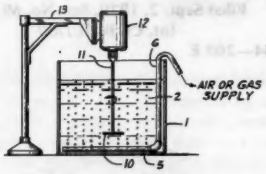
therebeneath, and it is coupled with the cutter blade so as to reciprocate in response to oscillatory movement of that blade. The coupling is such that a constant spacing is maintained between the cutting edge of the blade and the adjacent side of the gauge means.

3,667,523

APPARATUS AND PROCESS FOR THE REMOVAL OF THE GERM AND BRAN COAT FROM CEREAL GRAINS

Lawrence Lynn; John W. Hunnell, both of Houston, Tex., and Carl B. Leger, Kaplan, La., assignors to Food Engineering International, Inc., Abbeville, La.

Filed Dec. 29, 1969, Ser. No. 888,219
Int. Cl. B02b *3/08*
U.S. Cl. 146—221.8 **12 Claims**



An improvement in apparatus and method for the removal of the seed coat, or bran layers, and the germ from cereal grains in the presence of a liquid. Said improvement in apparatus and method includes the provision, and use, of a vessel containing kernels of grain (preferably whole kernels) immersed in a liquid medium, and means for moving a member such as a blade or bar rapidly through the liquid medium and preferably at a velocity relative to said medium in excess of 10 feet per second to cause an impacting face of said movable member to strike against the kernels of cereal grain in said liquid to detach the seed coat and germ from said kernels.

3,667,524

HIGH-ENERGY PROPELLANT CONTAINING COATED HYDRAZINIUM AZIDE

John E. Paustian, Whippany, and Marvin M. Fein, Westfield, both of N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

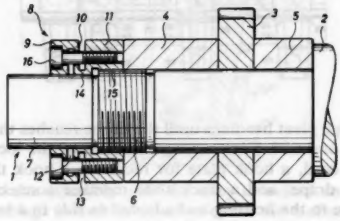
Original application May 12, 1966, Ser. No. 551,838, now Patent No. 3,459,607, dated Aug. 5, 1969. Divided and this application Mar. 28, 1969, Ser. No. 828,052
Int. Cl. C06b *19/02*
U.S. Cl. 149—8 **3 Claims**

A high energy propellant of hydrazinium azide coated with a non-hygroscopic coating.

3,667,525
THREADED RING

Rudolf Spieth, Kennenburger Str. 40, D 73 Esslingen am Neckar Kennenburg, Germany

Filed July 28, 1970, Ser. No. 58,867
Claims priority, application Germany, July 29, 1969, P 19 38 448.6
Int. Cl. F16b *39/00*
U.S. Cl. 151—21 C 3 Claims

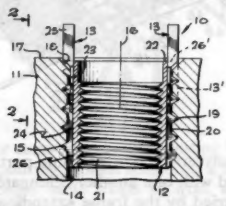


A threaded ring of one piece construction for securing cutters and the like to a shaft is disclosed. The ring has a single threaded portion for engaging threads upon the shaft. An outer portion has screws which pass through an intermediate portion and engage other threads in the threaded portion. By tightening the screws, the intermediate portion flexes radially to lock onto the shaft, preventing the threaded ring from loosening upon the threads of the shaft.

3,667,526
FASTENERS HAVING LOCKING KEYS

Robert Neuschotz, 1162 Angelo Drive, Beverly Hills, Calif.

Original application Feb. 12, 1969, Ser. No. 798,659, now Patent No. 3,537,118. Divided and this application Mar. 17, 1970, Ser. No. 20,294. The portion of the term of the patent subsequent to Mar. 21, 1989, has been disclaimed.
Int. Cl. F16b *39/06*
U.S. Cl. 151—23 14 Claims



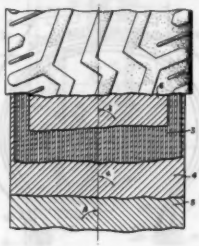
A fastener having a thread with a groove extending through and interrupting the thread, and a locking key retained in the groove and adapted to be driven axially to lock the fastener in a carrier part, with the groove being deformed by the key, upon initial installation thereof in the groove, to a slightly undercut cross-section confining and retaining the key in the groove.

3,667,527
TREAD RING FOR REMOVABLE TREAD TIRES

Carlo Magistrini, Monza, and Luigi Malocchi, Milan, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed June 30, 1970, Ser. No. 51,100
Claims priority, application Italy, July 29, 1969, 20215 A/69; Mar. 13, 1970, 21873 A/70
Int. Cl. B60c *11/02*
U.S. Cl. 152—176 8 Claims

A separable tread ring for pneumatic tires which embodies an armor longitudinally resistant to tension, the armor being formed by a helically wound metal cord, the coils of which are disposed generally parallel to the mid-circumferential plane of the tire. Two additional layers of metal cords parallel to each other in each layer are provided, the cords being disposed in two directions crossed relative to the mid-circumferential plane at angles ranging from 10° to 65°. The latter

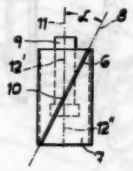


layers are disposed radially inwardly relative to the armor. A third layer of extensible metal cords is positioned radially outwardly of the armor, the cords of such layer being inclined with respect to the mid-circumferential plane at an angle ranging between 10° and 65°.

3,667,528
SPIKE FOR MOTOR VEHICLE TIRES

Georg Gottauf, Munich, Germany, assignor to Stahlgruber Otto Gruber & Company, Munich, Germany

Continuation-in-part of application Ser. No. 736,616, June 13, 1968, now Patent No. 3,545,515. This application July 10, 1970, Ser. No. 53,838
Claims priority, application Germany, July 26, 1969, P 19 38 091.7
Int. Cl. B60c *11/16*
U.S. Cl. 152—210 9 Claims



Spike for motor vehicle tires comprises casing of synthetic material with reinforcing jacket embedded in casing. Hard metal pin is centrally disposed in reinforcing jacket. Jacket surrounds hard metal pin and includes pair of opposed side edge portions that overlap one another to form a seam. Alternatively, opposed side edge portions of reinforcing jacket may meet along line of contact which is curved and sloping relative to longitudinal axis of metal pin.

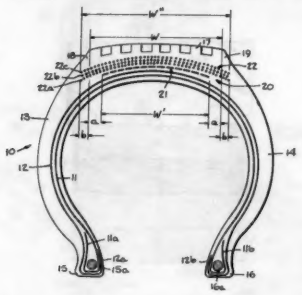
3,667,529
HIGH SPEED RADIAL PLY TIRES

Henri Mirtain, Compiegne, France, assignor to Uniroyal Englebert France, Neuilly sur Seine, France

Filed May 20, 1970, Ser. No. 39,115
Claims priority, application France, May 30, 1969, 6917845
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 27 Claims

Radial ply pneumatic tires capable of being run at very high speeds are disclosed. Such tires are characterized by a tread-reinforcing breaker having a plural-layer non-metallic textile cord ply structure wider than the tread, with the cords oriented at a O° angle to the median equatorial plane, and a single-layer ply structure, narrower than the tread, of metallic wires or strips oriented at a substantial bias angle, preferably between about 20° and 45°, to the said plane. The plural-layer ply structure is constituted by a single length of

breaker cord fabric wound in a continuous spiral circumferentially of the carcass for at least a plurality of full turns. If the metal ply structure in such a tire is superposed onto the



textile ply structure, the tire is additionally provided with means indicating the manner in which it should be mounted on a vehicle so as to have a specified direction of rotation during normal high speed forward movement of the vehicle.

3,667,530

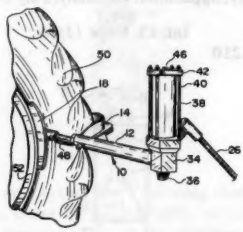
PORTABLE TIRE BREAKER

John V. Gray, P.O. Box 217, Severy, Kans.

Filed Oct. 9, 1970, Ser. No. 83,261

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.26 **7 Claims**



This tool can be easily made from mostly standard parts, such as standard pipe for the cylindrical arm having an arched member to straddle a tire of any size fixed to one end of the pipe and a piston in said pipe having a rod extending from the inner end of said pipe with a wedge head on its outer end for pressing against the bead edge of a tire, while the outer end of the arched member is purchased against the opposite edge of the wheel rim, and a hand pump unit having a threaded port connected to the outer end of the cylindrical arm for pumping fluid under pressure against said piston to press said wedge head between the bead edge of the tire and the rim edge of the wheel for breaking the tire off the side of the rim without necessarily removing the wheel from its axle. The tool can be readily handled by the cylindrical arm with one hand while the other hand is used for operating the hand pump. A tire iron may be used for the pump handle.

3,667,531

DRAPE SLIDE CARRIER

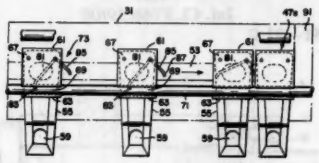
Edmond J. Wilkins, Levittown, Pa., assignor to Reversafold Inc., Levittown, Pa.

Filed Feb. 2, 1971, Ser. No. 111,852

Int. Cl. A47b *5/032*

U.S. Cl. 160—345 **7 Claims**

A drape slide carrier for a draw drape for homes and the like, said drape carrier preventing bunching or gathering of drape pleat headings as the drape is being opened, comprising a housing adapted to receive a pull cord, a cord lock and release member pivotally mounted in the housing with a locking leg for grasping the cord when the drape is being opened to move the drape and prevent bunching or gathering



of the drape pleat headings until the drape reaches the end of its travel, and with a release leg for releasing the locking leg from the cord, a hook plate for receiving a hook that supports the drape, and a track slide member connecting the hook plate to the housing and adapted to ride in a track of a drape traverse rod.

3,667,532

PIECE OF FURNITURE

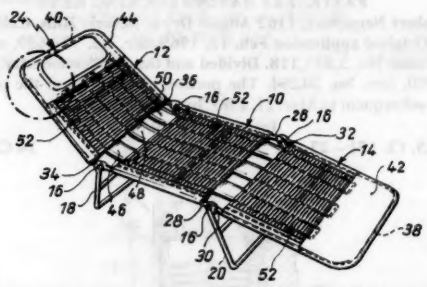
Rudolf Kurz, Bissingen, Germany, assignor to Kurz GmbH, Bietigheim, Germany

Filed June 23, 1970, Ser. No. 49,034

Claims priority, application Germany, June 27, 1969, P 19 32 649.9

Int. Cl. A47c *7/02*

U.S. Cl. 160—371 **15 Claims**



A frame has transversely spaced frame portions which are suitably connected with one another. Elongated flexible support webs are carried by the frame extending in parallelism with one another and with the frame portions. Flexible tubular sections of synthetic plastic material extend transversely of the frame portions from one to the other, being located in parallelism with each other and arrayed lengthwise of the frame portions. Sheet-material strips are each connected with the end portions of the tubular members located adjacent the respective frame portions; these sheet material strips extend lengthwise of the respective frame portions and are secured to the same.

3,667,533

MAKING DIRECTIONALLY SOLIDIFIED CASTINGS

Raymond R. Boucher, Tequesta, Fla., and Charles M. Phipps, Jr., Wapping, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

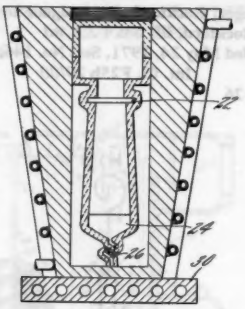
Filed Apr. 28, 1970, Ser. No. 32,593

Int. Cl. B22d *25/06*

U.S. Cl. 164—60 **3 Claims**

A mold having a crucible portion connecting with the article forming portion is positioned within a tapering susceptor

heated by a surrounding induction coil and the susceptor serves to control the temperature gradient during the solidification of the alloy in the mold. The crucible is located at the



bottom of the assembly until the alloy is melted and the entire assemblage is then inverted to cause the molten alloy to flow into the article portion of the mold, the latter being preferably positioned on a chill plate.

3,667,534

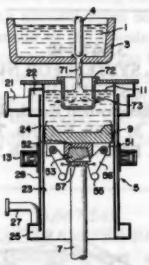
STEEL INGOT MAKING METHOD

Tatsuro Kanokogi, Osaka, and Kunio Yasumoto, Hyogo, both of Japan, assignors to Sumitomo Metal Industries Ltd. (Sumitomo Kinzoku Kogyo Kabushiki Kaisha), Osaka-shi, Japan

Continuation of application Ser. No. 703,385, Feb. 6, 1968, now abandoned. This application Mar. 11, 1971, Ser. No. 123,394

Int. Cl. B22d *11/12, 27/10*

U.S. Cl. 164—83 **5 Claims**



A method for semi-continuously casting long-length, large steel ingot by pouring molten steel into a thin walled, water cooled, long-length mold made of iron, steel or cast iron which does not thermally deform, in contact with the molten steel during pouring and withdrawing the solidifying ingot down through the mold at suitable speed without directly water cooling the solidifying ingot until a predetermined length of ingot is obtained, and then holding the ingot in the mold for a while till the ingot solidify enough to draw out from the mold on to a truck which carry away the said ingot to further processing and apparatus thereof.

3,667,535

CONTROLLED ATMOSPHERE GRAVITY CASTING SYSTEM

Marshall K. Thomas, Jr., and James N. Thompkins, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1970, Ser. No. 83,059

Int. Cl. B22d *27/16*

U.S. Cl. 164—258 **8 Claims**

An improved system for evaluation of unique materials formed by quenching the same in their liquid state under predetermined controlled uncontaminated gaseous environment. The apparatus permits rapid solidification of the

material in the desired gaseous atmosphere such that the possibility of undesirable oxidation or contamination is minimized.

3,667,536

APPARATUS FOR RECIPROCATING CONTINUOUS CASTING MOULDS BY MEANS OF FLEXIBLE DRAWING MEMBERS

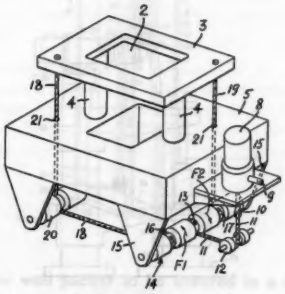
Piero Colombo, 27, Via Leopardi, Udine, Italy

Filed Sept. 23, 1970, Ser. No. 74,643

Claims priority, application Italy, Sept. 27, 1969, 7339 A/69

Int. Cl. B22d *11/00, 27/08*

U.S. Cl. 164—260 **9 Claims**



An apparatus for vertically reciprocating open-ended moulds for the continuous casting of metals. The apparatus comprises a supporting platform for each mould, and means for slidably guiding said platform in its reciprocating movement. Hydraulic or mechanical driving means are provided for effecting said reciprocating movement and flexible drawing members, such as ropes, cords, cables, chains or straps, connect said driving means to said platform.

3,667,537

COOLING DEVICE FOR A CONTINUOUS-CASTING WHEEL

Robert Petit, Rosny-Sous-Bois, France, assignor to Societe Nouvelle Spidem, Paris, France

Filed Dec. 30, 1969, Ser. No. 889,023

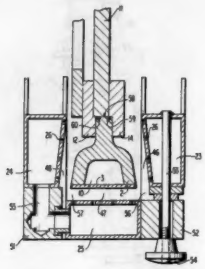
Claims priority, application France, Dec. 30, 1968, 182114

Int. Cl. B22d *11/06*

U.S. Cl. 164—278 **8 Claims**

A cooling device in which spaces are left between two ad-

joining boxes surrounding the wheel so as to permit cleaning



while the wheel is moving.

3,667,538

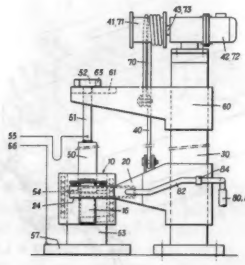
COOLING SYSTEM FOR CONTINUOUS CASTING INSTALLATIONS

Otmar Kleinhagauer; Peter Cerwenka, and Ewald Neubauer, all of Kapfenberg, Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria

Continuation of application Ser. No. 773,622, Nov. 5, 1968, now abandoned. This application May 12, 1971, Ser. No. 142,771

Int. Cl. B22d *11/00, 27/02*

U.S. Cl. 164—283 **9 Claims**



A continuous casting installation with a structure for cooling the mold. The continuous casting mold is provided with a cooling means formed in part by a pair of opposed upper arms which extend from the mold. A carriage means is provided for moving the mold, and this carriage means has a pair of arms extending beneath and engaging the upper arms of the mold so that the arms of the carriage means form a pair of lower arms coacting with the upper arms to support the mold on the carriage means. The upper arms form part of a cooling means for the mold, while the lower arms of the carriage means are formed with passages through which cooling fluid is directed to and from the cooling means of the mold. In this way it becomes possible to simply separate a mold from the carriage means with an automatic separation of the cooling connections, and a new mold, of a different size, for example, can replace the old mold, with the connections for the flow of cooling fluid being automatically made simply by mounting of a new mold on the carriage means.

3,667,539

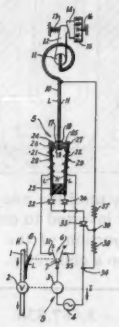
ON-OFF TIME PROPORTIONING SUMMER-WINTER THERMOSTAT AND CONTROL SYSTEM EMPLOYING SAME

Russell P. Sweger, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed May 24, 1971, Ser. No. 146,117

Int. Cl. F25b *29/00*

U.S. Cl. 165—26 **12 Claims**



A heating-cooling thermostat employs alternative circuits during heating and cooling seasons to move an actuator in one direction. Heaters controlled by thermostatic contacts in each of the alternative circuits heat bimetals to open the contacts periodically to provide pulsed on-off current through the actuator. The on-off time ratio is modified by the deviation of the controlled temperature from a setpoint to provide on-off time proportioned current to the actuator.

3,667,540

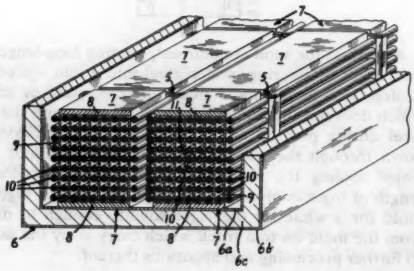
HEAT REMOVAL SYSTEM FOR NUCLEAR FUEL ASSEMBLIES

Robert W. Kupp, 227 Beechwood Road, Ridgewood, N.J.

Filed Sept. 3, 1968, Ser. No. 756,882

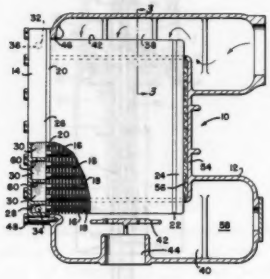
Int. Cl. F28f *7/00;* **G21h** *5/00*

U.S. Cl. 165—47 **6 Claims**



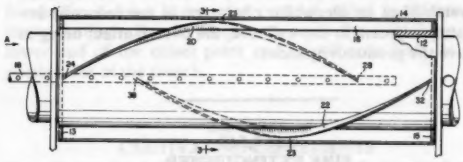
A system to remove heat from nuclear fuel assemblies is disclosed. Such heat removal system includes one or more units having a base and one or more plates extending outwardly therefrom, the units being adapted to fit in a nuclear fuel assembly when it is placed in a shipping cask. The plates of the heat removal device, which are formed of a heat conductive material, fit between the pins of the nuclear fuel assembly and convey heat from the assembly to the shipping cask, from whence it is removed to the atmosphere by conduction through the cask.

3,667,541
COOLER FOR GAS
Frank D. Howe, Painted Post, N.Y., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 17,672
Int. Cl. F28d 1/06
U.S. Cl. 165—74 6 Claims



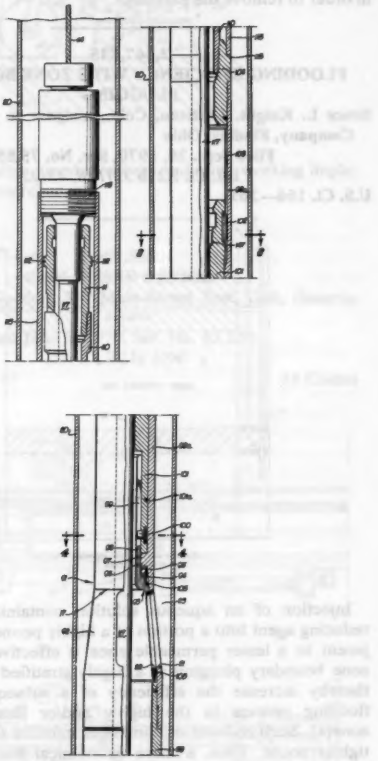
A cooler for gas of a radiator type having a unitized and readily replaceable core. The core comprises a plurality of tube nests which are stacked in surmounting relationship. The nests are held in this relationship in that the tubes terminate in, and are held by, at either ends thereof, tube plates. Inside and outside waterheads enclose the ends of the tubes and are fixed to the tube plates. These components comprise the replaceable and unitized tube core. The core is carried within a shell or housing and bolted thereto at one end thereof for its replaceable mounting therein. The housing has transverse ribs having arcuate cross sections. These ribs are arrayed across the inside of the housing, and face the external surfaces of the core to redirect gas from the housing back into the tube nests. The housing includes inlet and outlet gas plenums, at the upper and lower portions thereof, for conducting gas through the cooler and through the core. The waterheads have porting to accommodate circulation of cooling water.

3,667,542
HEAT TRANSFER ROLL
Ralph C. Parkes, Hancock Street and Lehigh Avenue, Philadelphia, Pa.
Filed Jan. 5, 1971, Ser. No. 104,005
Int. Cl. F28f 5/02
U.S. Cl. 165—89 3 Claims



An inner cylindrical shell; an outer cylindrical shell enclosing, and spaced from, the inner shell to provide a jacket adapted to hold a high boiling point liquid; a source of heat in said inner shell for heating the liquid, and agitating means operable when the roll is rotated to bring said liquid into uniform contact with the inner surface of said outer shell.

3,667,543
RETRIEVABLE WELL PACKER
Michael R. Dean, Houston, Tex., assignor to Baker Oil Tools, Inc., Commerce, Calif.
Original application Mar. 2, 1970, Ser. No. 15,403, now Patent No. 3,580,332, dated May 25, 1971. Divided and this application May 22, 1970, Ser. No. 39,637
Int. Cl. E21b 33/12
U.S. Cl. 166—125 33 Claims

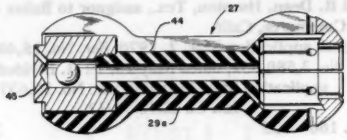


A retrievable well packer to be lowered in a well casing and having a main body with expanders and initially retracted slips thereon for anchoring the body to the well casing, and also an initially retracted packing thereon expandable against the casing, the slips and packing being expanded by moving the body upwardly and a device downwardly along the body, the upward force and movement of the body being transmitted to the slips and packing by a structure releasably locked to the body, such structure being released from the body when the well packer is to be retrieved to enable the body to be moved upwardly of the slips, expanders and packing to effect retraction from the casing of such slips and packing.

3,667,544
DUMBELL SCRAPER
Willard F. Allimon, Hacienda Heights, Calif., assignor to Shell Oil Company, New York, N.Y.
Filed Sept. 9, 1970, Ser. No. 70,743
Int. Cl. E21b 37/02
U.S. Cl. 166—170 6 Claims

A dumbell-shaped paraffin scraper of a type that may be

pumped through a paraffin coated portion of a well flow line



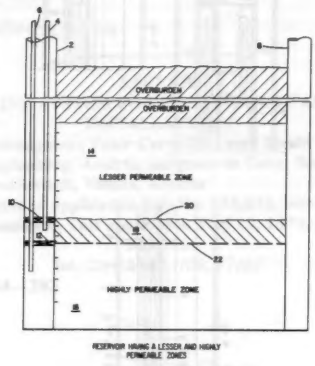
in order to remove the paraffin.

3,667,545

FLOODING EFFICIENCY WITH ZONE BOUNDARY PLUGGING

Bruce L. Knight, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sept. 28, 1970, Ser. No. 75,859
Int. Cl. E21b *33/138, 43/22*
U.S. Cl. 166—269 **6 Claims**



Injection of an aqueous solution containing a mobility reducing agent into a portion of a highly permeable zone adjacent to a lesser permeable zone is effective to influence zone boundary plugging in a highly stratified reservoir and thereby increase the efficiency of a subsequent micellar flooding process in the highly and/or lesser permeable zone(s). Such reduces or eliminates micellar slug loss to the tighter zones. Thus, a more economical flood can be effected.

3,667,546

WATERFLOODING METHOD

Harry W. Parker, Lubbock, Tex., assignor to Phillips Petroleum Company

Filed May 28, 1970, Ser. No. 41,543
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **9 Claims**

A method of waterflooding a formation with a flood water and surfactant mixture whereby gel particles are added to the injection mixture to improve the efficiency of the flood.

3,667,547

METHOD OF CEMENTING A CASING STRING IN A WELL BORE AND HANGING IT IN A SUBSEA WELLHEAD

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Aug. 26, 1970, Ser. No. 67,005
Int. Cl. E21b *33/13, 29/00*
U.S. Cl. 166—286 **5 Claims**

Method of cementing a casing string in a well bore and hanging it in a subsea wellhead, a safety joint being incorporated in the string below a casing hanger secured to the latter, enabling the joint to be disconnected, in the event the casing string sticks in the well bore during its reciprocation while being cemented, and the casing string above the joint and the casing hanger removed. An extension tool secured to the lower end of a length of casing string is attached to the

casing hanger and spaced therefrom a distance corresponding to the distance between the wellhead and upper end of the casing string cemented in the well bore, and is lowered to place the tool over such upper end, with the hanger landed in the wellhead, after which the casing string cemented in placed is pulled upwardly into and secured to the extension tool by slips of the tool.

3,667,548

METHOD OF WELL STIMULATION

Harry W. Milton, Jr., Findlay, Ohio, assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 7, 1970, Ser. No. 95,965
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 R **15 Claims**

Crude oil production from a producing means in fluid communication with an oil-bearing subterranean reservoir is improved by injecting into the formation about 0.1 – 10 barrels of a micellar dispersion per vertical foot of oil-bearing sand and then injecting a sufficient volume of hydrocarbon solution containing an oil-wetting agent, e.g. high molecular amines, substituted-ammonium compounds, etc., into the formation to displace the micellar dispersion radially out into the reservoir and to wet the reservoir rock with the hydrocarbon solution to a distance of about 3 – 20 feet, and thereafter returning the well to production. Such a process, inter alia, improves the relative permeability to the flow of crude oil and establishes an oleophilic character in the reservoir immediately adjacent to the wellbore, the overall effect being to improve the productivity index.

3,667,549

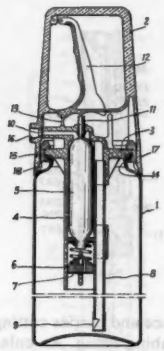
FIRE EXTINGUISHER

Frederic Sachs, Neuilly-sur-Seine, and Guy Vanotti, Oyonnax, both of France, assignors to Compagnie Centrale Sicli, Le Blance-Mesnil, France

Filed May 24, 1971, Ser. No. 146,161
Claims priority, application France, June 15, 1970, 7021858
Int. Cl. A62c *13/00*
U.S. Cl. 169—31 R **8 Claims**

A portable extinguisher having a reservoir for an extinguishing medium, a functional plate secured thereto by a cut

segment member having a "C"-shaped cross-section which serves to position a hood member so as to align an opening in



the skirt of the hood member with an outlet nozzle in the functional plate member.

3,667,550

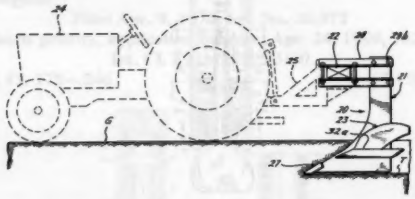
LISTER-CHISEL COMBINATION

Charles L. Lehman, Route 3, P.O. Box 53, Corpus Christi, Tex.

Continuation-in-part of application Ser. No. 703,977, Feb. 8, 1968, now Patent No. 3,554,296. This application Oct. 22, 1969, Ser. No. 868,556. The portion of the term of the patent subsequent to Jan. 12, 1988, has been disclaimed.

Int. Cl. A01b *13/08, 39/20*

U.S. Cl. 172—700 **3 Claims**



A plurality of chisels are supported in spaced-apart locations along a laterally extending tool bar which is adapted to be moved forwardly over the ground level. Each chisel has a forwardly extending point at its lower end for penetrating the soil to form a narrow trench therein as the tool bar moves forwardly. A lister is mounted on each chisel to dispose its lower cutting edges in position to sever the soil above the lower end of the chisel point and turn it onto beds on opposite sides of the trench.

3,667,551

CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10 Weverskade, Maasland, Netherlands

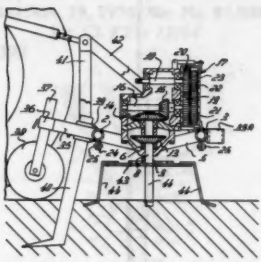
Continuation of application Ser. No. 727,109, May 6, 1968, now abandoned. This application July 8, 1970, Ser. No. 56,164

Claims priority, application Netherlands, May 12, 1967, 67/06637

Int. Cl. A01b *33/00*

U.S. Cl. 172—59 **5 Claims**

An agricultural machine with implements that are powered by rotary shaft, the connections between the implements and the shafts include quick releases so that various implements,



including spreaders, tined members and other working implements, can be interchanged.

3,667,552

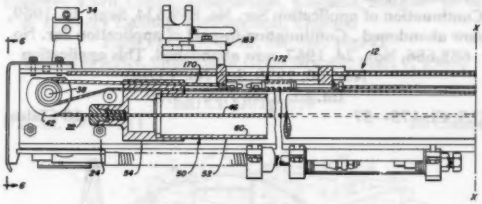
CABLE FEED DEVICE

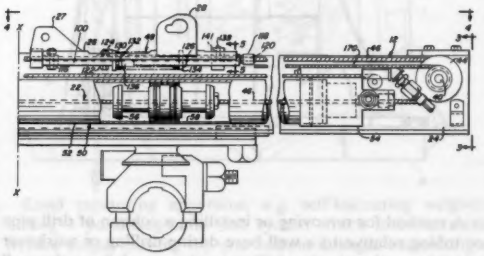
John Edward Gordon, 337 Main Street East, Galt, Ontario, Canada

Filed June 3, 1970, Ser. No. 43,138

Int. Cl. E21c *5/06*

U.S. Cl. 173—147 **14 Claims**





A cable feed device for a drilling apparatus and more particularly improved means for maintaining tension in a feed cable during the feeding of a drill rod.

3,667,553

TELESCOPING SEA FLOOR SOIL SAMPLER

Henry L. Gill, Ojai, Calif., assignor to The United States of America as represented by the Secretary of the Navy

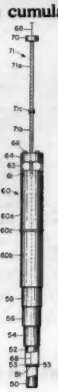
Original application Apr. 1, 1969, Ser. No. 813,403, now Patent No. 3,576,220. Divided and this application Dec. 14, 1970, Ser. No. 97,827

Int. Cl. E21b *7/12, 49/02*

U.S. Cl. 175—6 **5 Claims**

A deep penetrating ocean bottom soil sampler employing a plurality of telescoping tubes that may be sequentially driven

downwardly to penetrate the ocean floor a distance equal to approximately ½ of the cumulative length of the tubes. As



the sampler with extended tubes is withdrawn, it extracts an elongate core comprising a representative ocean bottom soil sample.

3,667,554

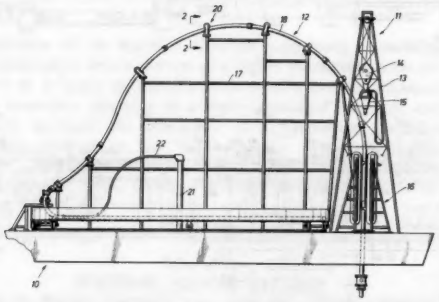
METHOD FOR HANDLING COLUMN OF DRILL PIPE DURING DRILLING OPERATIONS

Eugene A. Smitherman, 1921 Bank of South West Building, Houston, Tex.

Continuation of application Ser. No. 859,634, Sept. 22, 1969, now abandoned , Continuation-in-part of application Ser. No. 685,686, Nov. 24, 1967, now abandoned. This application Nov. 30, 1970, Ser. No. 93,840

Int. Cl. E21b *7/00, 19/00*

U.S. Cl. 175—57 **10 Claims**



A method for removing or installing a column of drill pipe or tubing relative to a well bore during drilling or workover operations wherein the drill string is moved from the well bore preferably in one continuous piece without breaking it into shorter sections, and is moved in an upwardly and radially outwardly curved path from the well bore to a substantially horizontal attitude for storage preferably in a generally circular configuration on the ground or support means for later return to the well bore moving approximately along the same path, and as one piece.

3,667,555

AIR DRILLING METHOD USING CONTROLLED SPLIT STREAM

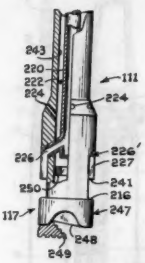
Wayland D. Elenburg, P. O. Box 1588, Monahans, Tex.

Filed May 11, 1970, Ser. No. 36,352

Int. Cl. E21b *49/02*

U.S. Cl. 175—60 **10 Claims**

Method and apparatus for drilling and for obtaining uncontaminated formation samples with an air hammer by flowing compressed air down through the tubing annulus of a dual pupe string to a novel sub, where the flow divides to enable part of the air to power the air hammer while the remaining air flow is directed into the hole annulus. The spent air ex-



hausts from the bit face and carries cuttings back into the sub and into the inner tubing string. An enlargement formed on the sub exterior prevents comingling of the samples with material from the borehole annulus.

3,667,556

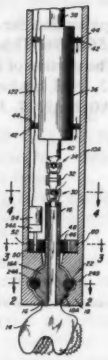
DIRECTIONAL DRILLING APPARATUS

John Keller Henderson, 4012 East 41st Place, Tulsa, Okla.

Filed Jan. 5, 1970, Ser. No. 979

Int. Cl. E21b *7/04*

U.S. Cl. 175—73 **3 Claims**



This invention relates to a directional drilling apparatus. More particularly, the invention is a drilling tool including provisions for changing the direction of drilling of a borehole, the tool including a tubular body having means at the upper end for attachment of a drill string, a drill bit affixed to the lower end of the body by means of a slip clutch drill bit so that the drill bit is rotated when the tubular body is rotated while permitting the drill bit to be rotated independently of the body, means within the tubular body for rotating the drill bit, and means controllable from the surface of the earth of varying the angle of the drilling axis of the drill bit relative to the tubular body.

3,667,557

MUD DIVERTER AND INSIDE BLOWOUT PREVENTER DRILLING TOOL

William L. Todd, Los Angeles, Calif., and James D. Mott, Houston, Tex., assignors to Hydril Company

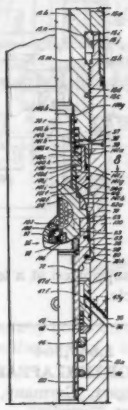
Filed Jan. 20, 1971, Ser. No. 107,951

Int. Cl. E21b *27/00, 41/00, 17/04, 21/00*

U.S. Cl. 175—242 **22 Claims**

A tubular member positioned in the drill string above a drill bit includes a rotatable ball valve to divert drilling fluid

and the like in the well bore if the drill bit nozzles become clogged thus permitting continued circulation of the drilling fluid. The member also includes a movable sleeve to automatically prevent flow of the drilling fluid or the like up the



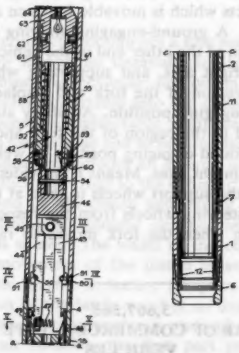
drill string from the drill bit. The rotatable ball valve tends to prevent clogging of the drill bit nozzles by maintaining smaller channeled openings in the rotatable ball valve unclogged by wiping the ball valve surface and flushing the wiped clogging particles into the well bore.

3,667,558

CABLE-TYPE CORING APPARATUS FOR RETRIEVING UNDERGROUND SPECIMENS

Honore Joseph Lambot, Rue Kindermans 14, 1050 Bruxelles, Belgium

Filed Apr. 9, 1970, Ser. No. 26,972
Claims priority, application Belgium, Apr. 24, 1969, 73209
Int. Cl. E21b *9/20, 25/00*
U.S. Cl. 175—246 **2 Claims**



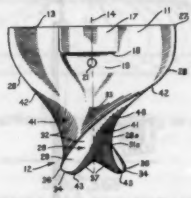
A cable-type coring apparatus comprises a string of tubing with an annular coring bit at its lower end, a coring head with a core extractor slidable within the tubing, and means for retrieving the head with a cut core therein. Water under pressure forces the coring head and retrieval means downwardly until the head locks in coring position in the tubing with a latch action. An upward pull on the cable unlatches the head and also vents the water under pressure so that it no longer forces the assembly downward, whereupon continued pulling on the cable retrieves the coring head and cut core.

3,667,559

PILOT BIT WITH MULTIPLE CUTTING EDGES

John G. Bennetti, Cupertino, Calif., assignor to Pengo Corporation, Sunnyvale, Calif.

Filed Nov. 19, 1970, Ser. No. 91,058
Int. Cl. E21c *13/04*
U.S. Cl. 175—392 **5 Claims**



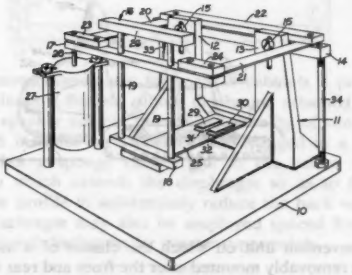
Earth auger pilot bit is an improvement upon U.S. Pat. No. 2,773,673. The body of the bit is cone-shaped with a "fish tail" lower extremity. The improvement consists of having two (or more) spiral cutting blades protruding from the cone-shaped body and extending into the fish-tail, the second blade on each side joining the leading blade of the other at the bottom of the bit to reinforce same. The plural blades resist fracture upon severe impact and divide the wear, thereby prolonging the life of the bit.

3,667,560

WEIGHING APPARATUS

Geoffrey Cyril Cooke, Stourbridge, England, assignor to W. & T. Avery Limited, Birmingham, England

Filed Feb. 27, 1970, Ser. No. 14,942
Claims priority, application Great Britain, Mar. 7, 1969, 12,090/69
Int. Cl. G01g *3/14*
U.S. Cl. 177—211 **16 Claims**



Load measuring apparatus, e.g. self-indicating weigher, having a parallelogramic link system which includes three flexure strips, forming top and bottom linkages connecting a frame member and a moveable load receiving member. Two of the strips are spaced apart horizontally to form one linkage, which may be the top one; and the other strip, which mounts a plurality of strain gauges responsive to flexure thereof to provide a measure of the applied load, forms the other linkage, e.g. the bottom one.

3,667,561

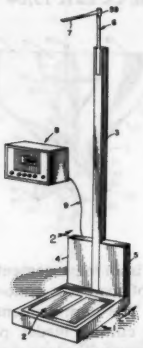
WEIGHING AND HEIGHT MEASURING DEVICE

William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Chicago, Ill.

Filed Oct. 26, 1970, Ser. No. 83,924
Int. Cl. G01g *23/37, 19/50*
U.S. Cl. 177—245 **6 Claims**

A device for measuring weight and/or height especially adapted for use with a remote digital read-out system com-

prising a mechanical leverage weighing structure having a high degree of sensitivity and low friction and hysteresis coupled with a compatible electronic measuring system and/or a height measuring means compatible with said system.

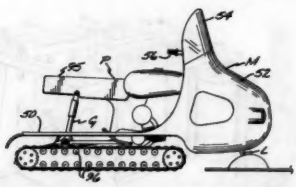


3,667,562

MOTORCYCLE SNOWMOBILE CONVERSION UNIT

William F. Compton, 675 W. Hamilton, Apt. D, San Pedro, Calif.

Filed Oct. 30, 1970, Ser. No. 85,421
Int. Cl. B62m *27/02*; B62d *55/04*
U.S. Cl. 180—5 R **5 Claims**



A conversion unit on which the chassis of a motorcycle may be removably mounted after the front and rear wheels of the motorcycle have been separated therefrom, and the motorcycle when so positioned on the unit cooperating therewith to provide a power driven snowmobile. The unit is particularly adapted for use in portions of the country that are subject to extensive snowfall, with the motorcycle capable of being used for its normal purposes during the spring, summer and fall of the year, and during the winter being removably mountable on the unit to provide a vehicle that can negotiate a snow-covered terrain.

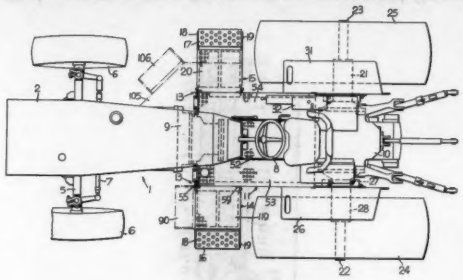
3,667,563

SUPPORTING STRUCTURE FOR PLATFORM DEFINING FUEL AND BATTERY COMPARTMENT

Eugene V. Korb, West Allis, and Robert C. Haupt, Milwaukee, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 21, 1969, Ser. No. 878,748
Int. Cl. B62d *25/00*
U.S. Cl. 180—68.5 **11 Claims**

Platform support structure on a tractor having access steps to the platform level and providing supporting structure for a fuel tank and battery compartment. The fuel tank and battery compartments are supported at a level below the operator platform of the vehicle.

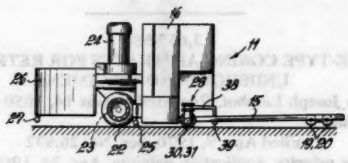


3,667,564

TRANSPORTING APPARATUS

Gerhard Schnell, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 4, 1970, Ser. No. 86,686
Claims priority, application Germany, Nov. 6, 1969, P 19 55 837.3
Int. Cl. B62d *5/04*
U.S. Cl. 180—79.1 **14 Claims**



A vehicle from one of whose longitudinally spaced ends a lifting fork projects which is movable between a raised and a lowered position. A ground-engaging steering wheel is provided in the region of the other end of the vehicle and pivotable about an upright axis, and supporting wheels turnably mounted in the region of the fork and displaceable to and from a ground-engaging position. Auxiliary steering wheels are also provided in the region of the fork and displaceable to and from a ground-engaging position as well as pivotable about auxiliary upright axes. Means is provided for effecting displacement of the support wheels to, and at the same time of the auxiliary steering wheels from the respective ground-engaging position when the fork moves to raised position, and vice versa.

3,667,565

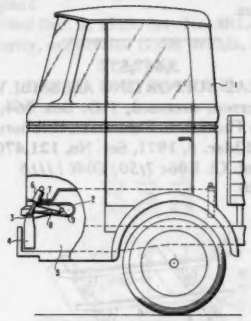
DRIVER CAB OF COMMERCIAL-TYPE MOTOR VEHICLES

Adolf Steiner, Gerlingen, and Hans Rinnergschwentner, Rotenfels, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed May 22, 1970, Ser. No. 39,764
Claims priority, application Germany, May 24, 1969, P 19 26 779.9
Int. Cl. B62d *27/04*
U.S. Cl. 180—89 **15 Claims**

A driver cab for commercial-types of vehicles which is spring-supported with respect to the vehicle frame by spring

or guide elements arranged between the vehicle frame and the driver cab on opposite sides of the vehicle; the spring or



guide elements are thereby connected with each other by a stabilizer, preferably in the form of a torsion rod.

3,667,566

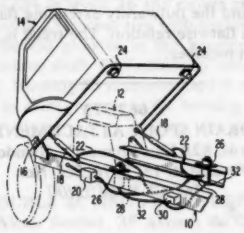
RELEASABLE CONNECTOR, PARTICULARLY FOR TILT CAB VEHICLES

William C. N. Hopkins, P. O. Box 4551, Walnut Creek, Calif.

Filed May 28, 1970, Ser. No. 41,182

Int. Cl. B62d *27/06*

U.S. Cl. 180—89 **20 Claims**



A releasable connector comprises a first part in the form of a collar or cup having an internal annular groove and a second part comprising a cylinder and piston jointly defining a latch arrangement insertable into the collar and including an annular expansible-contractable latch member for selectively nesting in said groove and to secure said parts together. The latch arrangement includes an annular latch part having a conical latch face and fixed to the cylinder, and an annular latch part carried by the piston and having a conical latch face jointly defining an annular channel within which the latch member is seated. The width of the channel is varied selectively by movement of the piston to expand the latch member into the groove to secure the parts together or to permit retraction of the latch member so that the two parts can be separated. The connector is particularly adapted for use with tilt cab vehicles, the first part preferably being secured to the cab and the second part being mounted on the vehicle chassis.

3,667,567

ROCKET POWERED GROUND EFFECT MACHINE

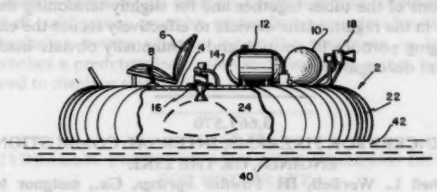
Eugene V. Rutkowski, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Feb. 26, 1970, Ser. No. 14,592

Int. Cl. B60v *1/14*

U.S. Cl. 180—117 **7 Claims**

A rocket powered ground effect machine is provided which has a self contained propellant supply which powers a rocket engine to provide gas pressure within a plenum. This



type of device has particular applicability in non atmospheric conditions.

3,667,568

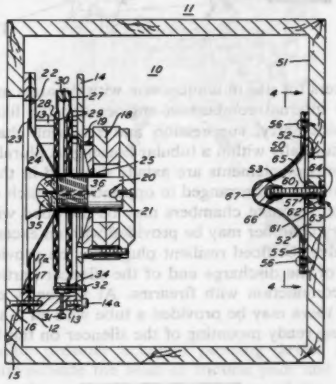
PRESSURE COMPENSATOR FOR SPEAKER CABINETS

Arthur Liebscher, c/o Electronics, Inc., Industrial Park, Willow Grove, Pa.

Filed Sept. 15, 1970, Ser. No. 72,463

Int. Cl. G10h *13/00*; H04r *1/28*

U.S. Cl. 181—31 B **8 Claims**



A pressure compensator for speaker cabinets is provided which includes a flexible rubber diaphragm attached to the rear of a speaker cabinet covering a plurality of vent holes and which includes an adjustable rod engaged in a plastic dome within a sponge rubber ball at the center of the diaphragm which extends the diaphragm so as to form a logarithmic profile to substantially reduce the back wave. A second diaphragm may also be employed spaced from the first mentioned diaphragm for greater suppression.

3,667,569

SOUND TUBE HEADSET

Richard C. Mackey, Woodland Hills, and W. James Neill, Santa Monica, both of Calif., assignors to Acoustifone Corporation, Chatsworth, Calif.

Filed Jan. 11, 1971, Ser. No. 105,343

Int. Cl. A61b *7/02*; G10k *13/00*; G02k *13/00*

U.S. Cl. 181—31 R **7 Claims**

A sound tube headset formed of flexible tubing having arcuate end portions adapted to rest on the ears, extend

downwardly behind the ears and forwardly in front of the wearer and with an adjustable slider for holding the lower portions of the tubes together and for slightly tensioning the same in the region of the clavicle to effectively secure the ear engaging portions in position and substantially obviate inadvertent dislodgment.

3,667,570

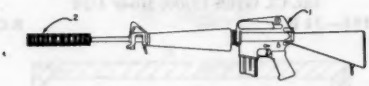
SILENCERS FOR FIREARMS, INTERNAL COMBUSTION ENGINES, OR THE LIKE

Mitchell L. WerBell, III, Powder Springs, Ga., assignor to Michael H. Adair and Rosser S. Reeves, III, New York, N.Y., attorneys-in-fact

Continuation-in-part of application Ser. No. 700,239, Jan. 24, 1968, now Patent No. 3,500,955, dated Mar. 17, 1970. This application Mar. 16, 1970, Ser. No. 19,829

Int. Cl. F41f *17/12;* **F41c** *21/18;* **F01n** *1/08*

U.S. Cl. 181—36 R **27 Claims**



Silencers for use in conjunction with firearms and as mufflers for internal combustion engines and the like are provided with entry, suppression and resonant chambers arranged coaxially within a tubular housing. A plurality of helical suppressor elements are axially disposed in the suppression chamber and arranged in opposition to each other. The entry and resonate chambers may be provided with baffles. The entry chamber may be provided with an excess pressure relief valve. Orificed resilient plugs may be provided in the vicinity of the discharge end of the silencer particularly for use in conjunction with firearms. At the entry end of the silencer there may be provided a tube with an L-shaped slot permitting ready mounting of the silencer on the barrel of a firearm.

3,667,571

SOUND-INSULATING DEVICE FOR NOISY APPARATUS

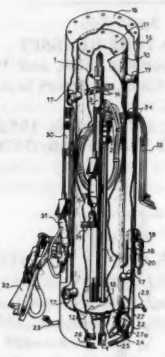
Robert Fattelay, 21 B rue Nicolas Bruand, 25 Besancon, France

Filed May 17, 1971, Ser. No. 143,900

Claims priority, application France, Nov. 6, 1970, 7040095

Int. Cl. F01n *1/08*

U.S. Cl. 181—36 A **11 Claims**



Sound-insulating device for apparatus generating intensive noise comprising a series of *n* impervious enclosures of increasing dimensions, the first enclosure having the smallest dimensions enclosing completely and directly the said apparatus, the second enclosure surrounding at least partially the first enclosure and so on, the means for securing the apparatus to the first enclosure and the means for securing the enclosures to one another being constituted by vibration-damping members.

3,667,572

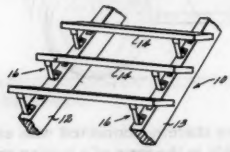
TREAD SUPPORTING ASSEMBLY

Charles E. Anderson, deceased, P.O. Box 264, late of Sardinia, Ohio (Ann Thackston, Executrix), Hillsboro, Ohio

Filed Mar. 5, 1971, Ser. No. 121,470

Int. Cl. E06c *7/50;* **E04f** *11/16*

U.S. Cl. 182—220 **4 Claims**



A tread support assembly for mounting a stair tread on a beam having a sloping upper face. The tread support includes an angle shaped support member and a main member of substantially channel shape. One flange of the main member and one flange of the support member are attached to the sloping face of the beam with the web of the main member resting on a free end of an outwardly extending flange of the support member adjacent the other flange of the main member. A slide member embraces and holds the other flange of the main member and the outwardly extending flange of the support member in flatwise relation. The tread is attached to the web of the main member.

3,667,573

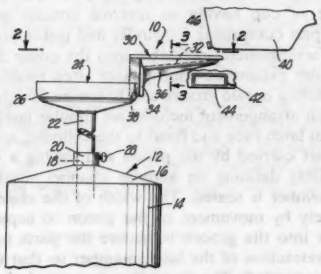
DRAIN SPOUT ATTACHMENT

James D. Edwards, 828 East Plymouth, Glendora, Calif.

Filed Sept. 15, 1970, Ser. No.

Int. Cl. F16n *33/00*

U.S. Cl. 184—1.5 **1 Claim**



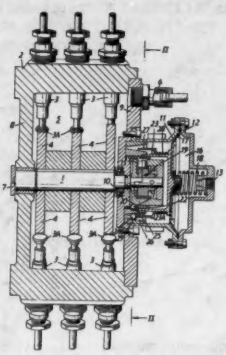
A drain spout attachment for an automobile crankcase oil drainage receptacle of the type having an upright collection tank with an upwardly opening funnel at its upper end and adapted for collecting drainage oil from the crankcase of an automobile elevated on a hoist. The spout attachment mounts on and projects horizontally from the funnel rim in a manner such that the receptacle may be placed below the automobile with the spout projecting over the hoist frame member which normally underlies the automobile crankcase drain opening to permit location of the spout directly below the drain opening.

3,667,574

CHASSIS LUBRICATION SYSTEMS

Max Edward Grantham, Plympton, Plymouth, England, assignor to Tecalemit (Engineering) Limited, Plymouth, Devon, England

Filed Dec. 2, 1969, Ser. No. 881,423
Claims priority, application Great Britain, Dec. 3, 1968, 57,369/68
Int. Cl. F16n 7/14, 13/22
U.S. Cl. 184—7 R 3 Claims



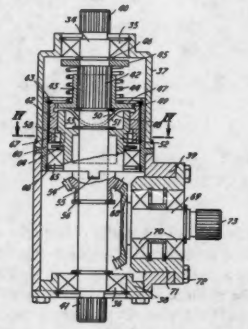
A motion transfer device is provided for use in lubricating apparatus and systems. This device is for axial mounting on a pump having a rotating shaft. A diaphragm 17 is moved by reduced air pressure in space 16 and moves an inner housing 23 axially. Housing 23 cooperates with member 19 via balls 21 running in helical grooves in the housing and member. This member causes shaft 1 to rotate by use of a pawl and ratchet (14,15). Housing 23 is constrained to move axially by balls 24 rolling in axial grooves in the housing 23 and on part 29 (FIG. 1).

3,667,575

DOUBLE ACTING FREE WHEEL

Marcel Pierre Alexis Bouhot, 35 Avenue du General Sarrail, Paris, France

Original application Apr. 9, 1968, Ser. No. 719,922, now Patent No. 3,499,511, dated Mar. 10, 1970. Divided and this application Sept. 12, 1969, Ser. No. 870,726
Claims priority, application France, Apr. 19, 1967, 103325; Nov. 21, 1967, 129035
Int. Cl. B60z 7/12
U.S. Cl. 188—134 1 Claim



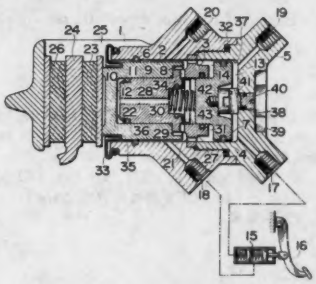
The invention relates to stopping device for disconnecting two shafts, which comprises input drive means, an output driven shaft, displaceable wedging cam means releasably coupling said input drive means to said output driven shaft, means to displace said wedging cam means thereby to release said input drive means and said output driven shaft, means sensitive to the torque resisting rotation of said output driven shaft, said torque sensitive means being associated with said displacing means whereby when the resistance to torque reaches a predetermined value said displacing means is actuated to displace said wedging cam means.

3,667,576

HYDRAULIC PRESSURE ACTUATED PRESSING DEVICE FOR DISC BRAKE

Tadasu Irie, Toyonaka, and Kaname Doi, Ibaragi, both of Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Jan. 27, 1971, Ser. No. 110,237
Claims priority, application Japan, Jan. 29, 1970, 45/8180
Int. Cl. B60l 11/20
U.S. Cl. 188—345 2 Claims



A hydraulic pressure actuated pressing device for disc brake to compensate the wear of friction pads and to keep the braking clearance constant. A piston of the pressing device has a liquid chamber inside thereof containing a quantity of liquid so that a proper braking cleance is maintained in accordance with the increase of the wear of friction pads while preventing the piston from being retracted even when the hydraulic braking pressure is lost.

3,667,577

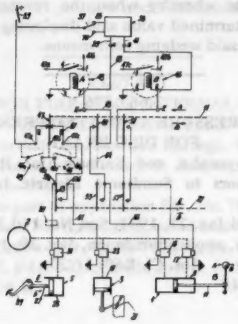
VEHICLE SPEED RESPONSIVE CONTROLS FOR TRANSMISSION, CLUTCH AND ENGINE

Charles Terres Weymann, Paris, France, assignor to S.I.D.A.R.O Societe Industrielle de Dispositifs Automatiques Robomatic, Oise, France

Filed Apr. 7, 1970, Ser. No. 26,305
Claims priority, application France, Apr. 28, 1969, 6913392
Int. Cl. B60k 21/00, 29/00
U.S. Cl. 192—.08 9 Claims

The present invention relates to an automatic gearbox control device for automobiles which is applicable to any conventional mechanical gearbox and can be coupled to an existing vehicle without any major modification. The control device comprises : a source of pressure fluid, a double-action ratio-changing jack actuated by said pressure fluid through two electrovalves selectively, and an electrical regulating contactor propelled at a speed proportional to that of the vehicle and comprising two terminals selectively supplied with current by said regulator from the vehicle battery for supplying two connections to said electrovalves respectively, each of said connections comprising two contactors in parallel, namely a self-maintaining contactor activated by the ratio-changing member operatively connected to said jack and a maneuver contactor activated by the vehicle clutch i.e.

which closes in the de-clutched position. The control device also includes means for automatically idling an associated engine or cutting off the fuel supply thereto during ratio shifting.



3,667,578

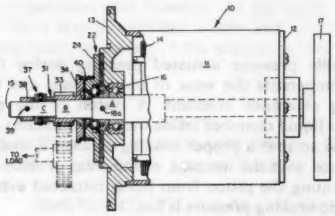
BI-DIRECTIONAL DRIVE RELEASED BRAKE

Robert M. Johnson, Levittown, Pa., assignor to Harold Beck & Sons, Inc., Newtown, Pa.

Filed May 14, 1971, Ser. No. 143,535

Int. Cl. F16d *67/00, 55/48*

U.S. Cl. 192—8 R **4 Claims**



A bi-directional stop clutch or brake for power transmitting rotating shafts is disclosed in which a friction disc is fixed to a fixed housing from which a power transmitting shaft extends. A clutch disc adapted to engage said friction disc is rotatably and slidably disposed on the shaft without the housing for braking the shaft. A drive collar is pinned to the shaft concentrically of the friction disc and between the clutch disc and the housing. The drive collar has formed therein a concentric series of conical depressions, and the clutch disc has also formed therein a corresponding series of conical depressions, the two series of depressions being in mutual alignment and holding therebetween a plurality of balls, one ball per each opposed pair of conical depressions. Distally of the clutch disc and spaced apart therefrom is a flanged pinion which is rotatably sleeved upon the shaft and positioned thereon by means of an annular thrust bearing and fixed collar positioned distally thereof. Facing portions of the flanged pinion and clutch disc likewise have corresponding concentric arrangements of conical depressions formed therein so as to house a plurality of balls therein. A helical spring engages the flanged pinion and clutch disc while being in compression, thereby normally urging the clutch disc into frictional engagement with the friction disc. The pinion is adapted to be connected to a load to be positioned by rotation of the power shaft. A power application to the shaft causes the pinion to be driven by the cooperating drive collar, balls, clutch disc and balls, while lifting the clutch disc out of frictional engagement with the friction disc. Back load similarly causes the clutch disc to be strongly urged into locking action, when power application ceases.

3,667,579

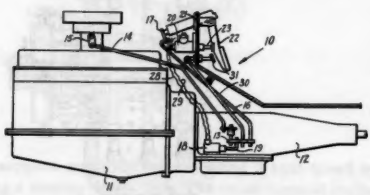
BRAKE OPERATED TRANSMISSION SHIFTER

Joseph Vizza, 414 Broad Avenue, Belle Vernon, Pa.

Filed Nov. 18, 1970, Ser. No. 90,646

Int. Cl. B60k *21/00*

U.S. Cl. 192—4 A **4 Claims**



An engine compression brake system in which an automatic transmission is down shifted to second gear and to low gear on moderate to heavy braking pressure applied to the brake pedal. The down shifting may be electrically actuated by pressure actuated switches which are exposed to the hydraulic pressure in the conventional brake system, by flexible cables which are moved by a piston system actuated by the hydraulic pressure in the conventional brake system and by mechanical linkage controlled by a separate foot pedal.

3,667,580

MACHINE TOOL INDEXING SYSTEM

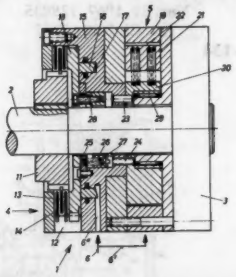
Willi Schacher, Friedrichshafen, and Heinz Marschner, Kressbronn, both of Germany, assignors to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Germany

Filed May 1, 1970, Ser. No. 33,545

Claims priority, application Germany, May 3, 1969, P 19 22 644.9; June 14, 1969, P 19 30 295.5

Int. Cl. F16d *67/02, 57/00*

U.S. Cl. 192—12 A **4 Claims**



In a machine tool a spindle is brought to a slow speed, e.g., for indexing to selective angular positions, by means of a clutch and a hydraulic pump, in a hydraulic control system, wherein the spindle is slowed down, or stopped, or reversed. The construction, and a number of modifications, envisages carrying a conventional indexing mechanism preferably on the spindle itself, together with the clutch, as well as the hydraulic pump in a compact assembly. The hydraulic system includes a pressure source and a throttle which controls differential pressures acting on the hydraulic pump to drive it as

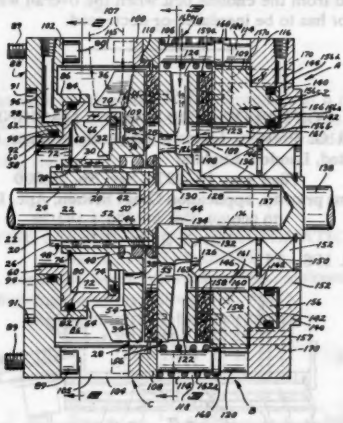
a motor by which the slow speed of the spindle is produced by rotation thereof through the clutch. Differential pressure in the system can be utilized in conjunction with a control device to which an indexing mechanism actuation is responsive. However, the invention has use in any installation where a compact mechanism for slow drive of a shaft is desired, or where it is desired to stop and momentarily reverse such shaft, the main power to the shaft being rendered ineffective in any suitable manner when the mechanism of the invention is operating.

3,667,581

COMBINATION CLUTCH-BRAKE

James V. Hanks, Minneapolis, Minn., assignor to Horton Manufacturing Company, Inc., Minneapolis, Minn.

Filed Mar. 16, 1970, Ser. No. 19,883
Int. Cl. F16d *67/02*
U.S. Cl. 192—18.1 **7 Claims**



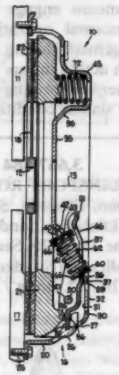
A combination clutch-brake which includes a clutch unit including a clutch housing, a first hub, an annular clutch piston slidably mounted on said hub, an annular clutch cylinder carried by said clutch housing, a friction disc having fins thereon slidably mounted on and rotatable with the first hub, a brake unit including a disc journal having air passageways extending radially therein and mounted on a second hub, means rotatably mounting said second hub axially on said first hub, spring means normally urging said friction disc out of engagement with said disc journal, a brake housing mounted on said second hub, means connecting said clutch housing with said brake housing said brake housing having an annular cylinder formed therein, an annular piston base having an annular brake piston thereon and slidable within the annular cylinder, the brake piston having a friction facing thereon in axial alignment with the disc journal, means for normally urging the annular brake piston with said friction facing thereon out of engagement with said disc journal, means for causing fluid pressure to urge said clutch piston against said friction disc to cause said second hub to rotate, means for causing fluid pressure to urge said brake piston against said disc journal to brake the second hub, the friction disc formed with air passageways extending therethrough, the disc journal formed with air passageways extending therethrough and communicating with said air passageways of said friction disc, the brake piston base formed with air passageways extending therethrough and communicating with said air passageways of said disc journal, and the means connecting said clutch housing with said brake housing being separable.

3,667,582

RADIAL SPRING CLUTCH

Howard O. Borck, Detroit, and Leo W. Cook, Royal Oak, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed July 27, 1970, Ser. No. 58,309
Int. Cl. F16d *23/00*
U.S. Cl. 192—99 A **15 Claims**



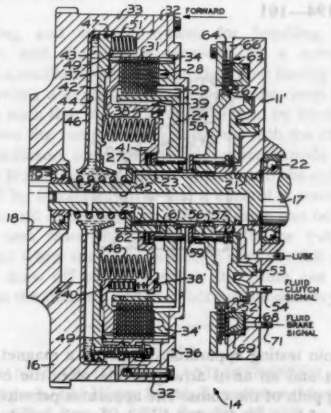
A friction clutch assembly including a driving member, a driven member, a reaction member, a pressure plate, release levers pivotally connected to the reaction member at a point between a front surface of the reaction member and the driving member and pressure springs disposed between the reaction member and the release levers such that upon wear of the friction facing an increase in mechanical advantage is used to maintain a substantially constant pressure plate load while the clutch is engaged regardless of clutch facing wear and upon clutch release a decrease in mechanical advantage is used to reduce operator's efforts.

3,667,583

SELF-MODULATED INPUT CLUTCH FOR VEHICLE DRIVE TRANSMISSIONS

Elmer A. Richards, Kalamazoo, Mich., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 22, 1970, Ser. No. 30,680
Int. Cl. F16d *23/10*
U.S. Cl. 192—105 A **6 Claims**



A clutch for a vehicle having a change speed gear box transmission automatically performs control functions which have heretofore required skilled manipulation of a clutch

pedal or the like by the operator. Springs exerting an engagement force on the clutch plates react against a movable piston which responds to a centrifugally generated fluid pressure to increase the spring force as a function of engine speed at the lower range of engine speeds. To facilitate start-ups and to avoid stalling, additional springs automatically disengage the clutch at the idling range of engine speed. The springs and variable fluid pressure provide modulated engagement or disengagement within an intermediate range of speeds and further means engage the clutch with a fixed clutch capacity at normal operating speeds. Fluid signal means force disengagement during shift transients at higher engine speeds. Clutch action differs under different operating conditions in a manner conforming with skilled manual control of a clutch under similar conditions.

3,667,584

TRANSPORT ROLLER

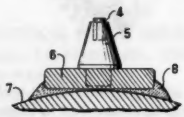
Bengt Sigvard Karlsson, Enskede, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Filed June 25, 1970, Ser. No. 49,855

Claims priority, application Sweden, July 8, 1969, 9631/69

Int. Cl. B65g *13/00*

U.S. Cl. 193—37 **2 Claims**



For a transport roller useful in handling timber and similar bulky objects, the surface of a cylindrical roller of metal is provided with spaced rows of studs tipped with wear-resistant material. The studs are fixed to steel strips, which strips are welded or otherwise anchored to the surface of the roller, being disposed in a predetermined pattern thereover.

3,667,585

COIN TESTING APPARATUS

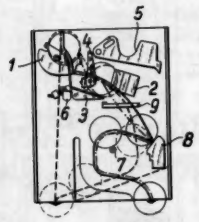
Werner Lindner, Buxtehude, Germany, assignor to National Rejectors, Inc. GmbH, Buxtehude, Germany

Filed June 16, 1970, Ser. No. 46,643

Claims priority, application Germany, July 10, 1969, P 19 34 911.2

Int. Cl. G07f *3/02*

U.S. Cl. 194—101 **2 Claims**



The coin testing apparatus comprises a magnet, a deflecting sheet and an anvil arranged one after the other in the dropping path of the coins. The apparatus permits separation of coins of low, medium and high electric conductivity in a way that the coins of low and high conductivity are directed to a channel for acceptable coins whereas the coins of medium conductivity are directed to the coin return channel.

3,667,586

ENDLESS BELT CONVEYORS

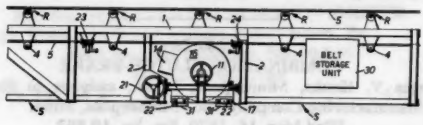
Edmund William Matthews, Hallow, England, assignor to Dowty Meco Limited, Worcester, England

Filed Nov. 2, 1970, Ser. No. 85,980

Claims priority, application Great Britain, Nov. 15, 1968, 56,023/68; 56,024/68

Int. Cl. B65g *15/00*

U.S. Cl. 198—1 **6 Claims**



An endless belt conveyor having means for mounting a reel for belting, whereby belting may be readily added to or removed from the endless belt when the overall length of the conveyor has to be increased or decreased.

3,667,587

CONTINUOUS ROD MAKING MACHINES

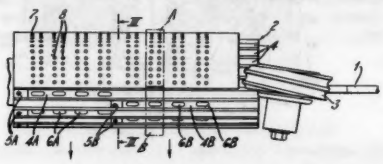
Edward G. Preston, London, England, assignor to Molens, Limited, London, England

Filed Apr. 15, 1970, Ser. No. 28,800

Claims priority, application Great Britain, Apr. 18, 1969, 20,000/69; Jan. 9, 1970, 1,192/70

Int. Cl. B65g *47/26*

U.S. Cl. 198—25 **10 Claims**



This invention is concerned with a fluted deflector drum which receives axially moving cigarettes or the like and decelerates them by means of suction in the drum applied through ports in the flutes. In order to adjust the deceleration, part of the drum is surrounded by a cowl formed with apertures which can be selectively closed to provide a variable restriction against air flow produced by the suction in the drum.

3,667,588

CONVEYOR SYSTEM

Robert J. Traube, San Mateo, Calif., assignor to FMC Corporation, San Jose, Calif.

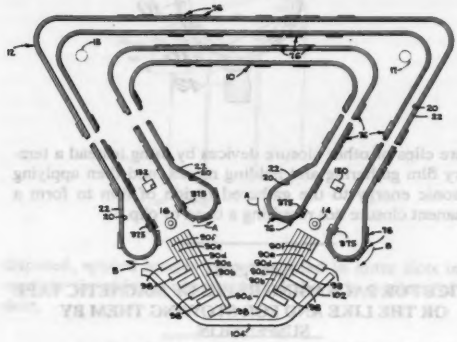
Filed Aug. 21, 1968, Ser. No. 754,443

Int. Cl. B65g *43/08, 47/10*

U.S. Cl. 198—38 **5 Claims**

A storage and retrieval system for goods has two power operated conveyors movable in separate endless loops past two (or more) spaced apart picking stations, each picking station common to both conveyors. Each conveyor has bins with compartments in which goods are stored. Although the bins on each conveyor remain in the same sequence, the bins are movable relative to each other on the conveyor to define "buffer" zones which permit simultaneous picking by two spaced apart pickers. The control system for the conveyors includes a reader which receives digital data concerning a group of orders to be picked from a stack of cards, each card giving the identity, quantity, and distribution of one of the articles to be picked. The two conveyors are automatically

stopped alternately with the bins containing ordered goods at the picking stations, and the operator at each picking station picks goods from the bins in accordance with a read-out unit which displays the card data. A plurality of packing lanes



originate at each picking station and terminate at a plurality of packing stations. Each picker distributes goods to the separate packing lanes in accordance with the read-out unit at the picking station.

3,667,589

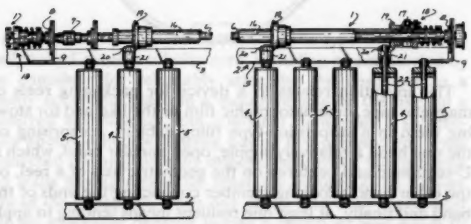
CONVEYING SYSTEM HAVING AN AUTOMATICALLY DEACTIVATED DRIVE

Charles F. Constable, South Milwaukee, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Apr. 1, 1970, Ser. No. 24,611

Int. Cl. B65g *13/02*

U.S. Cl. 198—127 **5 Claims**



A conveying system including a series of conveyor sections with each conveying section including a series of rolls to support the articles being conveyed. At least one roll of the series is a drive roll. A drive shaft extends longitudinally of the conveyor sections and the drive shaft is individually connected to each drive roll through a clutch which is arranged to disengage the driving connection to each drive roll under predetermined overload conditions. Means is also provided for returning the clutch to an engaged position after a predetermined period of disengagement, whereby the clutch will reengage if the overload condition has been cured and will again disengage if the overload condition continues to exist.

3,667,590

VIBRATORY PILE FEEDER

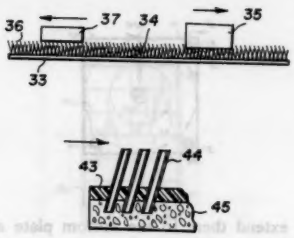
Dennis E. Mead, Cazenovia, N.Y.

Filed Jan. 2, 1970, Ser. No. 273

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 BA **3 Claims**

A feeder for objects uses a vibratory element bearing a pile material having parallel bristles inclined in the direction of feed. The tips of the bristles engage and resiliently support



objects to be fed, and the inclination of the bristles establishes the direction of feed as the element is vibrated.

3,667,591

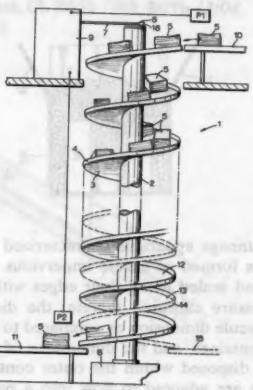
NEWSPAPER BUNDLE FEEDING AND STORING SYSTEM

Thomas R. Sykes, Toronto, Ontario, Canada, assignor to Gerrard Company Ltd., Hamilton, Ontario, Canada

Filed Nov. 19, 1969, Ser. No. 878,063

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 R **3 Claims**



A feeding and storage system for handling bundled newspapers and the like is provided by a spiral chute mounted for oscillatory movement, the chute having a helical ramp encircling a central vertical column the ramp having a helix angle such that the bundle will be held by friction from moving down the ramp under gravitation with the chute stationary. Oscillatory movement in the requisite mode to move the bundle from the input end of the ramp to the output end is provided by a suitable drive and a control is provided adjacent each end of the ramp so that the ramp can be filled as a storage unit from the input end with the output end blocked and when the ramp is full or partially full and it is desired to draw off stored bundles, the chute can be controlled from the delivery end to effect bundle delivery.

3,667,592

BAND-SAW CARRIER AND DISPENSER

George S. Ayoub, 124 Water Street, Leominster, Mass.

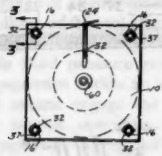
Filed Aug. 20, 1970, Ser. No. 65,632

Int. Cl. B65d *85/67*

U.S. Cl. 206—16 R **10 Claims**

A band-saw carrier and dispenser has a bottom plate and a cover plate which has posts that extend through holes in the

bottom plate. Retaining means retain the posts in said holes, which is accomplished by distorting portions of the posts, as



by heat, to extend them to the bottom plate and thereby retain both plates together.

3,667,593

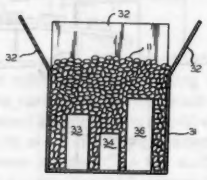
FLOWABLE DUNNAGE APPARATUS AND METHOD OF PACKAGING WITH FLOWABLE AND COMPLIABLE INFLATED DUNNAGE MATERIAL

John M. Pendleton, 5080 Maplewood, Greendale, Wis.

Continuation-in-part of application Ser. No. 777,940, Oct. 1, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 617,977, Feb. 23, 1967, now abandoned. This application Mar. 30, 1970, Ser. No. 23,650

Int. Cl. B65d *77/26, 81/02, 85/30*

U.S. Cl. 206—46 FR **5 Claims**



Flowable dunnage apparatus characterized by discrete inflated capsules formed of elastic impervious webs in facing relationship and sealed along their edges with a quantity of air under pressure captured therein, the discrete capsules being of minuscule dimension as compared to the dimensions of an outer container, and the dimensions of smaller articles or containers disposed within the outer container. The discrete capsules are adapted to flow into a partly filled container and to partly fill the interstices thereof, and to fill the outer container to a surcharged condition before the closing thereof. The closing of the outer container, either by placing flaps into position, or by placing a separable closure thereover, exerts pressure on the compliant capsules, causing them to fill the interstices of the outer container substantially completely, and to prevent migration or shifting of smaller containers or articles within the outer container.

The invention herein also comprehends a method of packaging with flowable and compliant dunnage material.

3,667,594

CLOSURE FOR FILM PACKAGES AND METHOD OF MAKING SAME

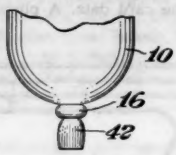
Arthur D. Herrell, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 20, 1969, Ser. No. 878,462

Int. Cl. B65d *75/48, 79/00*

U.S. Cl. 206—46 R **1 Claim**

A method of forming improved film packages of a type wherein one or more of the package ends or regions is gathered and tied closed by encircling metal bands, closure clips or other closure devices. The resultant closure of compressed film is made leak-proof by application of ultrasonic vibratory energy to the package in the vicinity of the gathered region of film. The invention in its modified embodiments further envisions elimination of present bands,



closure clips or other closure devices by using instead a temporary film gathering and holding means, and then applying ultrasonic energy to the gathered region of film to form a permanent closure not requiring a band or clip.

3,667,595

DEVICE FOR PACKAGING REELS OF MAGNETIC TAPE OR THE LIKE AND FOR STOWING THEM BY SUSPENSION

Pierre A. Posso, 20 rue Gandon, Paris 13°, France

Filed June 23, 1970, Ser. No. 49,112

Claims priority, application France, June 25, 1969, 6921301

Int. Cl. B65d *85/04, 85/66*

U.S. Cl. 206—53 **4 Claims**

This invention relates to a device for packaging reels of magnetic tape, cinematographic film or the like and for stowing them in a suspension-type filing cabinet, comprising on the one hand a relatively supple, open annular band, which is U-sectioned and centered on the geometric axis of a reel, on the other hand a locking member connecting the ends of the band and finally, at least one resilient means tending to apply said band, for the purpose of sealing, against the edge of the sides of the reel to be protected, wherein a resilient-return slide is guided in concentric translation on the outer face of the first end of the band, the free terminal part of this slide being separated, by a slit perpendicular to the above-mentioned axis, into two arms having two locking teeth projecting into a direction parallel to this axis, said teeth being capable of cooperating with a guard member unitary with the second end of this band and provided for the passage of said slide.

3,667,596

SHEET DISPENSING UNIT

Malcolm B. Lucas, Springfield Township, Hamilton County; Jaime P. Villanueva, Cincinnati, and Stewart Rowe, Wyoming, all of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

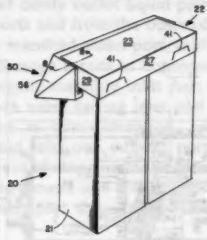
Filed May 27, 1970, Ser. No. 40,981

Int. Cl. B65d *71/00, 85/00*

U.S. Cl. 206—57 R **8 Claims**

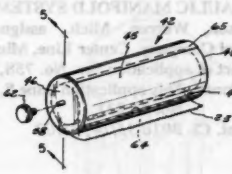
A sheet dispensing unit in which a stack of sheet materials is adhesively fastened along one end to a rectangular header

piece having a depending skirt along its periphery. The header piece is in turn suspended by a pair of oppositely



disposed, spaced hanger blades adapted to enter slots intermediate the sides of the stack and the side portions of the skirt.

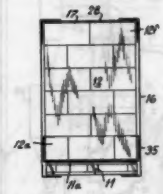
3,667,597
CONTAINER FOR DISPENSING PAPER
Leslie Hollister, 11204 Wester Road, Clio, Mich.
Filed Apr. 27, 1970, Ser. No. 32,288
Int. Cl. B65d *85/67;* **B65h** *75/38*
U.S. Cl. 206—58 **2 Claims**



A container for dispensing paper of the type which is normally rolled about a tubular core, including means carried by the container for releasably attaching the container to a readily accessible place in a motor vehicle or the like. In a preferred embodiment, the container comprises a substantially enclosed hollow housing having two opposed end walls connected by longitudinally disposed side walls; the opposing end walls having means for rotatably mounting the tubular core of the paper roll, while one of the side walls is provided with an elongated opening having a length at least equal to the longitudinal length of the paper roll to permit the withdrawal of selected lengths of the paper therethrough as the paper roll is rotated. In the second embodiment, means are provided on one of the end walls to cause rotation of the paper roll.

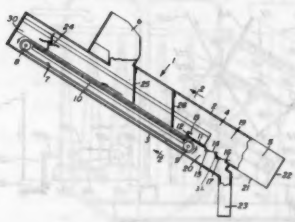
3,667,598
WRAPPED PALLET LOAD
Seymour Zelnick, Orange, N.J., and Martin Michael Wildmoser, Staten Island, N.Y., assignors to Weldotron Corporation, Newark, N.J.
Original application Oct. 7, 1968, Ser. No. 765,302. Divided and this application Feb. 18, 1971, Ser. No. 116,454
Int. Cl. B65d *65/16, 71/00, 85/62*
U.S. Cl. 206—65 S **7 Claims**

A pallet load of product is secured onto a pallet by enclosing the load including the top thereof in thermoplastic film which is heat shrunk to the load, to a sheet of thermoplastic film on the pallet under the load, and to the edge of the pallet therearound. The load enclosing film may be an inverted bag which covers the top and side of the load and the lower end of the bag is fused to said sheet which is on the pallet under the load. Alternatively, the side of the load may be covered by a sleeve of thermoplastic material and the top of the load may be covered by a separate sheet to which the



sleeve is fused. Also, layers of thermoplastic sheet material may be disposed between layers of the pallet load and heat sealed to the sleeve which surrounds the pallet load.

3,667,599
CONTINUOUS CORRUGATED BELT WITH WIRE SCREEN
Oliver K. Hobs, P. O. Box 1306, Suffolk, Va.
Filed Dec. 8, 1969, Ser. No. 882,846
Int. Cl. B03b *7/00;* **B07b** *13/04*
U.S. Cl. 209—12 **11 Claims**

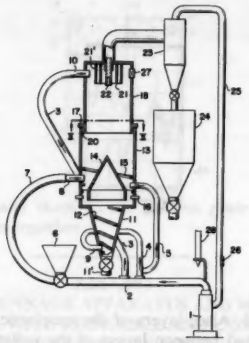


An apparatus adapted to separate peanuts from grass, vines, dirt and other waste material combines a sloping rotating continuous belt having recesses therein adapted to trap the waste material and carry it away as the peanuts roll down its sloping surface with baffles or curtains, a barrier or reservoir across the lower end of the belt and screening means to remove substantially all of the material which remains with peanuts after harvesting.

3,667,600
METHOD AND APPARATUS FOR CENTRIFUGAL CLASSIFICATION
Kazuo Oi, Tokyo, and Katuo Negishi, Nogami-Machi, both of Japan, assignors to Kazuo Oi, Tokyo, Japan
Filed Nov. 14, 1969, Ser. No. 876,822
Claims priority, application Japan, Nov. 27, 1968, 43/86786
Int. Cl. B04c *3/00*
U.S. Cl. 209—144 **4 Claims**

A method and apparatus for classifying powdery material comprising a tangential inlet for the material suspended in a gas, means above and below the tangential inlet for introducing additional gas tangentially in the same direction as said tangential inlet. Helical guides are provided for guiding the

material inflow and lower gas inflow upwardly. A peripheral inlet for inducing air from the outside of the apparatus is provided between the upper gas inflow and the material inflow to aid in dispersing the powdery material.

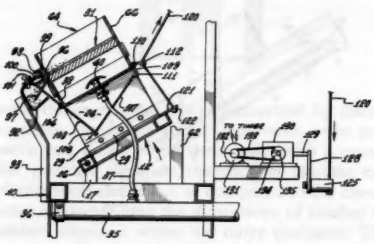


3,667,601

APPARATUS FOR THE DRY SEPARATION OF GRANULAR MATERIALS

Norris Johnston, and Mark Latker, both of Ojai, Calif., assignors to Albert M. Clark; John C. Manning, Bakersfield and John G. Troster, Atherton, all of Calif., part interest to each

Filed Oct. 6, 1969, Ser. No. 863,989
Int. Cl. B07b *3/00*
U.S. Cl. 209—466 **6 Claims**



Granular material dry separator apparatus embodying a resiliently mounted porous deck vibrated longitudinally, the deck having parallel transverse upper grooves at right angles to its longitudinal direction of vibration. Granular material is dropped onto the deck at one end, low pressure air being forced upwardly through the deck while it is being vibrated to cause granules or particles of greater specific gravity to drop to the bottom of the grooves while the lighter particles are caused to float upwardly and flow progressively from groove to groove toward the opposite end of the porous bed or deck. At predetermined intervals, a mechanism tilts the porous deck to discharge the granular contents in the grooves into collection troughs.

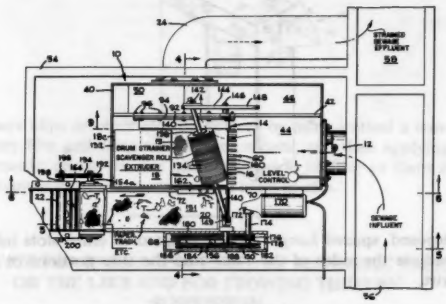
3,667,602

SELECTIVE COMMINUTION AND SCAVENGING METHOD

Richard Crandall, 17792 Lewis Lane, Huntington Beach, Calif., and Carl H. Nordell, Crystal Bay, Nev.

Original application Sept. 6, 1968, Ser. No. 757,877, now Patent No. 3,570,671. Divided and this application May 18, 1970, Ser. No. 48,746
Int. Cl. B01d *35/28*
U.S. Cl. 210—67 **5 Claims**

A drum screen is inserted into a raw sewage line. Rake fingers help elevate solid materials picked up by the screen from the influent and are cam retracted to leave them on the periphery of the screen. A hinged presser plate holds soft, organic material against the screen to be comminuted and carried away with the effluent and into the disposal system. A skew-mounted scavenger roller made up of flexible discs rotates against the screen for cleaning off pieces of paper, etc., that remain on the surface of the screen, for disposal as trash.

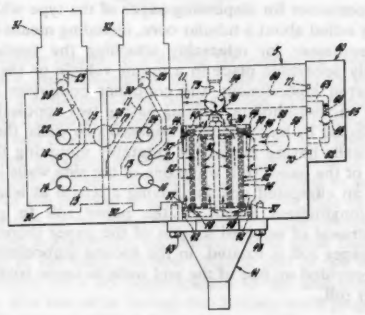


3,667,603

HYDRAULIC MANIFOLD SYSTEM

Richard B. Courson, Warren, Mich., assignor to Almo Manifold and Tool Company, Center Line, Mich.

Continuation-in-part of application Ser. No. 758,338, Sept. 9, 1968, now abandoned. This application June 8, 1970, Ser. No. 44,231
Int. Cl. B01d *35/14*, *35/02*
U.S. Cl. 210—130 **6 Claims**



A hydraulic manifold system is disclosed comprising, in combination, a hydraulic manifold having a liquid-directing hydraulic circuit therein, liquid filter means associated with said hydraulic manifold for filtering hydraulic liquid entering a part of said hydraulic circuit, and by-pass means including a uni-directional check valve associated with said filter means operative upon clogging of the filtering action thereof, each said hydraulic manifold, filter means and by-pass means itself consisting of no pipes, said filter means comprising a filter cavity having inlet and outlet liquid passage means therefor and constructed to receive within itself and to seal against a replaceable liquid filter cartridge disposed in said filter cavity, said hydraulic manifold having means for mounting thereon at least one hydraulic liquid flow-control valve, said hydraulic circuit comprising inlet and outlet ports in said hydraulic manifold for hydraulic liquid, respectively,

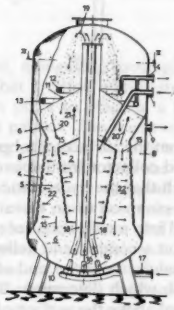
entering and leaving the latter, a pair of control ports in said hydraulic manifold for said flow-control valve for hydraulic liquid, respectively, entering and leaving said flow-control valve, and liquid passage means for directing hydraulic liquid from said filter cavity outlet liquid passage means to one of said control ports and from the other of said control ports to said hydraulic manifold outlet port, said filter cavity inlet and outlet liquid passage means in communication, respectively, with said hydraulic manifold inlet port and said one control port, said check valve having inlet and outlet liquid passage means therefor in communication, respectively, with said filter cavity and said one control port and constructed to open in the event of clogging of the filtering action to by-pass hydraulic liquid around said filter cartridge from said hydraulic manifold inlet port through said check valve to said one control port.

3,667,604

MOVING BED APPARATUS FOR THE TREATMENT OF FLUID

Pierre Lagoutte, Charly, France, assignor to Filtres Vernay, Villeurbanne (Rhone), France

Filed June 4, 1970, Ser. No. 43,467
Claims priority, application France, Sept. 9, 1969, 6931267
Int. Cl. B01d *33/16*
U.S. Cl. 210—136 **2 Claims**



A fluid is filtered by passing a stream of fluid through a porous wall of an inlet chamber through a treatment zone filled with treatment material and then through another porous wall into a collecting chamber. The flow from the inlet chamber to the collecting chamber is substantially horizontal and a vertically upwardly directed liquid stream passes through the treatment material at the bottom of the container to entrain particles of the treatment material and lift them to the top of the container to provide for recirculation of the treatment material. The treatment material is regenerated during the circulation with the impurities being removed from the container near the top portion thereof above the treatment material.

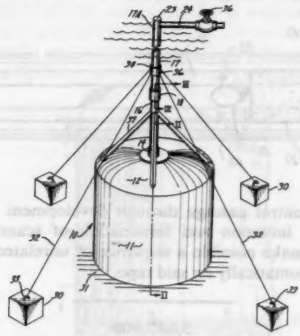
3,667,605

SUBMERGED OIL LEAK CONTROL

Robert O. Zielinski, Route #2, Box 20, Delton, Mich.

Filed May 4, 1970, Ser. No. 34,087
Int. Cl. E02b *15/04*
U.S. Cl. 210—170 **1 Claim**

Cup-shaped casing means inverted upon or adjacent to the ocean floor and tubular means extending upwardly from said casing means and communicating with the interior thereof through an opening in the top wall thereof. The tubular



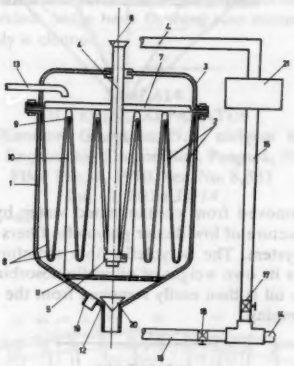
means is braced by a plurality of cables connected thereto and to anchor means located on the ocean floor.

3,667,606

CONSTRUCTION OF FILTERS

Carmen Muela Negro, O'Donnell 13, Madrid, Spain

Filed Dec. 17, 1970, Ser. No. 99,041
Claims priority, application Spain, Dec. 30, 1969, 375038
Int. Cl. B01d *27/04*
U.S. Cl. 210—193 **7 Claims**



A filtering canister which contains a filtering medium of diatomaceous earth which is retained within the canister by a foraminous support consisting of a series of concentric truncated cones of foraminous sheet material and a fabric disposed between the filtering medium and the sheet material. The innermost cone is secured at its inner edge around a central vertical pipe extending through the cover which permits the recharging of the filtering medium. Hoops are provided to loosely retain the fabric in place in the vertices of the cones when flow is arrested.

3,667,607

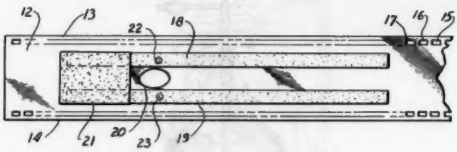
CHROMATOGRAPHIC MATERIAL

Marcus K. Brandt, Easton, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, Pa.

Filed Nov. 27, 1970, Ser. No. 93,299
Int. Cl. B01d *15/08*
U.S. Cl. 210—198 **10 Claims**

A thin layer chromatographic strip in the form of an elongated tape carrying indicia related to chromatographic test areas, the areas being in contact with a reservoir for solvent,

the combination of test areas, indicia, and reservoir being periodically reproduced on the length of the tape, whereby the indicia may be used to initiate sampling, solvent applica-



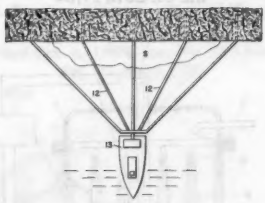
tion, and control passage through development and drying stages, and initiation and termination of scanning stages, thereby to make possible a sequence of unrelated or related analyses automatically on said tape.

3,667,608

APPARATUS FOR REMOVING OIL SPILLS FROM THE SURFACE OF A BODY OF WATER

Ralph H. Burroughs, Chapel Hill, and Paul R. Cox, Jr., Cary, both of N.C., assignors to Hercules Incorporated, Wilmington, Del.

Filed Apr. 24, 1970, Ser. No. 31,472
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **4 Claims**



Oil is removed from contaminated water by means of a fibrous structure of low denier polyolefin fibers attached to a pumping system. The polyolefin fiber structure can absorb many times its own weight of oil while absorbing little or no water. The oil is then easily removed from the fibrous structure by pumping.

3,667,609

APPARATUS FOR COLLECTING OIL FROM THE SURFACE OF A BODY OF WATER

William H. Daniel, 541 Putman Rd., Rogers, Ark.

Filed Oct. 13, 1970, Ser. No. 80,350
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **5 Claims**

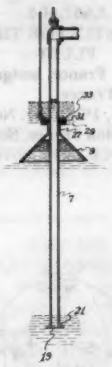
Oil is collected from the surface of a body of water by immersing a tent-shaped collector just under the surface of the water. The wave action drives oil down below the tent, and the oil rising under the tent then collects in the peak of the tent whence it is conveyed upwardly by hydrostatic pressure through a conduit into a flexible collection receptacle. The apparatus may be dropped from an airplane by a parachute, in which case the collection receptacle itself can be the parachute. The apparatus is buoyant yet weighted to maintain an upright attitude and to position the tent at a desired depth.

3,667,610

APPARATUS FOR COLLECTING OIL FROM THE SURFACE OF A BODY OF WATER

William H. Daniel, Route 3, Rogers, Ark.

Filed Feb. 8, 1971, Ser. No. 113,254
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **8 Claims**



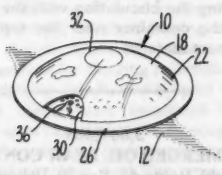
Oil is collected from the surface of a body of water by immersing a tent-shaped collector from above the surface of the water to a depth such that the hydrostatic pressure of the oil in the collector will pump oil to an elevation above the surface of the water and into a collection receptacle. The collector slides vertically on a conduit and delivers the oil into the lower end of the conduit, the lower end of the conduit being positioned at a depth which determines the height to which the oil can be pumped above the surface of the water.

3,667,611

SWIMMING POOL LEAF TRAP

Andrew L. Pansini, 180 Los Cerros Drive, Greenbrae, San Rafael, Calif.

Filed Feb. 11, 1970, Ser. No. 10,385
Int. Cl. E03f *5/04*; B01d *35/28*
U.S. Cl. 210—244 **4 Claims**



A portable leaf trap for use with swimming pools comprising a dome-like housing, perforate means affixed to the hous-

ing, a flexible base member extending outwardly from the housing, and lift means. An opening is provided in the side of the housing to provide communication between the outside of the housing and an interior defined by the perforate means and the housing inner surface. The leaf trap is adapted to be positioned over a swimming pool drain upon the floor of the pool with leaves and the like entering the trap interior through said opening. The lifting element is affixed to the perforate means in the vicinity of said opening and offset with respect to the center of gravity of the trap. When an upwardly directed force is applied to the lifting element, the leaf trap tends to pivot therearound thus trapping the leaves and the like within the interior at a location remote from said opening.

3,667,612

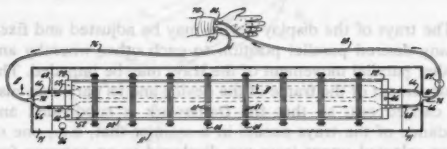
ARTIFICIAL KIDNEY SYSTEM

Joe H. Leonard, 1105 Remington Rd., Knoxville, Tenn.

Filed Sept. 4, 1969, Ser. No. 855,191

Int. Cl. B01d *31/00, 13/00*

U.S. Cl. 210—321 **15 Claims**



An open-topped, elongated, rectangular tank is mounted on a framework that is fitted with casters, enabling the unit to be moved from place to place in a hospital, clinic, or in the residence of a patient. The framework supports a motor driven recirculating pump for causing a continuous flow of a dialyzing fluid out of and back into the tank. A pair of clear, colorless elongated plates are clamped together with one or more lengths of clear colorless tubes of semipermeable material confined between them, and this assembly is immersed in the dialyzing fluid in the tank. The ends of the tube or tubes have connection to an artery and a vein of a patient, so that the patient's heart will produce a flow of his blood through the tubes, where toxic substances are removed from the blood by the dialytic action.

3,667,613

APPARATUS FOR FILTERING COOKING LIQUID

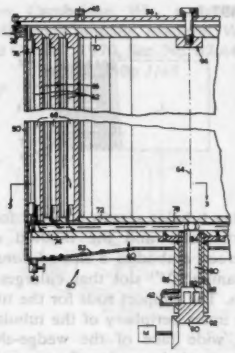
Raymond H. Angold, 179 Fairway Hill Crescent, Kingston, Ontario, Canada

Continuation-in-part of application Ser. No. 716,437, Mar. 27, 1968, now abandoned. This application Oct. 2, 1970, Ser. No. 77,592

Int. Cl. B01d *25/36*

U.S. Cl. 210—336 **16 Claims**

A filter assembly for use in apparatus for cooking food in a hot cooking liquid, in which the filter assembly is rotated to centrifugally clean the filter medium. The filter assembly is particularly suitable for continuously filtering uncooked and partly cooked foodstuffs from the cooking liquid, and is supported with a cooperating impervious tube spaced therefrom to form a receiving chamber for filtered liquid. The chamber is connected to a conduit for conveying the filtered liquid, for example, back to a supply reservoir for re-use. The filter medium is one of a cloth woven from strands or fibers of a fluorinated ethylene or propylene resin, a silicone-based thermosetting resin or like substance having similar non-stick and low friction characteristics; strands or fibers of the materials mentioned above pressed together into a felt-like mat structure; or a wire screen whose wire strands are substantially wholly coated, preferably with tetrafluorethylene, or another of the above resins. The filter assembly includes means for rotatably mounting the same in a housing. Preferably, at least one turbulence-generating bar or like structure is provided adjacent the filter surface. This bar creates turbulence in the liquid when the filter assembly is being rotated, and that turbulence tends to loosen filtered material deposited on the filter surface and effects an auxiliary cleansing action on said surface. At least one filter and impervious surface arrangement is provided. Some back flushing aiso occurs when the filter assembly is cleaned.



3,667,614

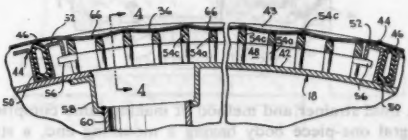
FILTERING APPARATUS

Thomas R. Komline, Gladstone, N.J., assignor to Komline-Sanderson Engineering Corporation, Peapack, N.J.

Filed Feb. 4, 1970, Ser. No. 8,531

Int. Cl. B01d *33/14*

U.S. Cl. 210—401 **3 Claims**



A rotary drum-type vacuum filter in which the grids which support the flexible filter medium over the filtering compartments of the drum are respectively formed to provide one or more corrugations extending generally in the direction of the drum axis and defining one or more channels, said corrugations also defining valleys in addition to said channels and into which the flexible filter medium is sucked during its immersion in the slurry being filtered to form corrugations in the filter media which mate with said valleys. Thereafter, when the filter medium emerges from the slurry with a filter cake formed thereon said mating corrugations, the channels are eliminated by removal of the filter medium from the drum for passage on to the discharge roll. Such elimination of the mating corrugations from the flexible filter medium and the resulting elongation of the filter medium relative to the less flexible filter cake, facilitates the separation of the cake from the medium.

3,667,615

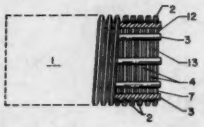
SELF-CLEANING TUBULAR SCREEN

David M. Likness, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 787,708, Dec. 30, 1968, now Patent No. 3,561,605. This application Oct. 5, 1970, Ser. No. 77,944. The portion of the term of the patent subsequent to Feb. 9, 1988, has been disclaimed.

Int. Cl. B01d *29/22*

U.S. Cl. 210—497.1 **8 Claims**



A self-cleaning tubular screen adapted for de-watering or classifying particulates and the method of making such screen. The screen embodies a slotted construction to provide a self-cleaning "V" slot that enlarges in the outward radial direction. The support rods for the tubular screen are located on the inner periphery of the tubular screen and attached to the wide face of the wedge-shaped wire in a manner so as to preclude any interference with the slot opening. This is accomplished by utilizing a wire having a ridge portion on the wide face thereof to prevent the weld connecting the wire to the rods from disturbing the edges of the wide face.

3,667,616

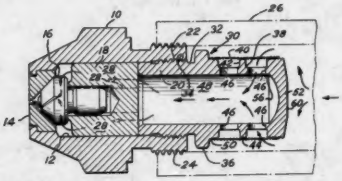
STRAINER

Alex Wayne, Des Moines, Iowa, assignor to Delavan Manufacturing Company

Filed Oct. 29, 1970, Ser. No. 85,170

Int. Cl. B01d *35/28*

U.S. Cl. 210—451 **6 Claims**



A fluid strainer and method of making same comprises an integral one-piece body having a mounting end, a strainer end and a cap member, both the strainer end and the cap member having a cross sectional dimension smaller than that of the strainer element. The strainer element is slid over the cap member and strainer end and is brought into abutting relationship with a shoulder which separates the mounting and strainer ends and the cross sectional dimension of the cap member is radially expanded in cross sectional dimension so as to engage the strainer element and firmly position and retain same on the strainer body.

3,667,617

TILTABLE RACK OR DISPLAY DEVICE

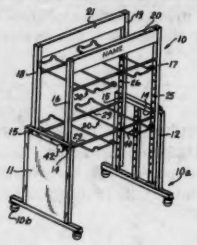
Jerry Cohn, 1546 Broadway, New York, N.Y.

Filed July 23, 1970, Ser. No. 57,647

Int. Cl. A47f *3/14*

U.S. Cl. 211—128 **12 Claims**

The invention has reference to tiltable and adjustable racks, carriers and like display devices equipped with shelves or trays for carrying articles, e.g., samples of fabrics, tiles, and other products. These display trays are connectable with a movable frame, which swings about pivot means from a neutral or median position to predetermined angular positions, in which the trays assume from a superposed and coinciding location to each other a parallel position in which the trays are transposed to a staggered formation or step-like positions, in which the articles retained on their successive trays, are exposed to view with their front and/or rear portions, as desired.



The trays of the display device may be adjusted and fixed in any desired parallel position to each other whereby any further parallel movement of the trays may be impeded. The arrangement of the frame of the device and its parts may also be carried out, so that the framework is subdivided and guidance of the trays occurs in a manner that, e.g., one or more selected upper trays are displaced to an extreme forward and parallel position, while one or more of selected lower trays are guided to likewise take up an extreme forward parallel position, whereas the remaining trays assume other non-coextensive or non-equidistant but parallel positions.

3,667,618

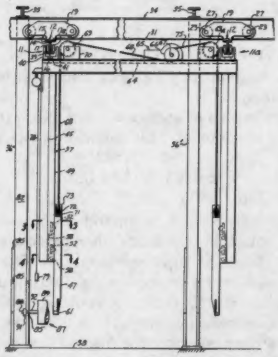
MECHANISM FOR LIFTING AND CONVEYING MATERIEL

Peter H. Bertola, Arcadia, Calif., assignor to General Conveyor, Inc., El Monte, Calif.

Filed Aug. 19, 1969, Ser. No. 851,356

Int. Cl. B65g *1/06*

U.S. Cl. 212—128 **1 Claim**



An overhead travelling crane movable along a path of travel, and also from side to side along the path has fixed to it a depending boom or mast which carries a movable section which can be raised and lowered to pick up materiel from either side of the path by means of a fork-like device near the bottom of the movable section. In the usual arrangement there are two such masts provided with lifting forks spaced apart from each other along the path, such that the forks can

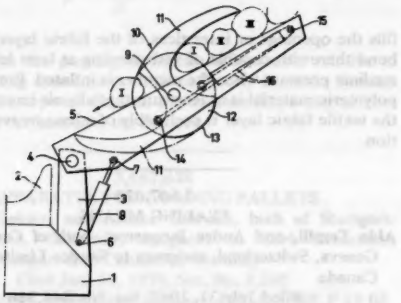
lift the two ends of cylindrical or pipe-like objects having cylindrical or tubular end members which can be grasped by the two spaced forks. Objects thus lifted by the forks can be carried along the path to some other location. A guide means equipped with wheels and rollers provides ease of movement of the movable mast sections up and down the fixed mast section without binding even under eccentric loading.

3,667,619

STEM FEED ARRANGEMENT

Thore Lindblom, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Filed Aug. 7, 1970, Ser. No. 62,087
Claims priority, application Sweden, Nov. 28, 1969, 16399
Int. Cl. B65g *61/00*
U.S. Cl. 214—1 PB **1 Claim**



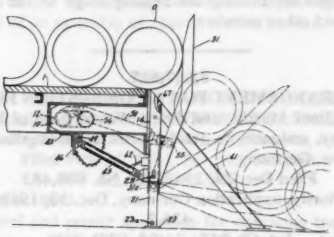
Felled trees were heretofore fed by a crane one by one to a working unit. This method implied poor utilization of the crane capacity. At the invention the upper part of an inclined sliding chute serves as a buffer space for trees into which a crane can load the entire tree bundle and during the intervals carry out other useful work. The buffer store of trees rests against the inside of the longer arm of an unequally armed angular lever, which with its corner is mounted at the sliding chute. By turning upwardly the shorter arm of the angular lever the tree located closest is taken along and by a full turn of the lever lifted over to the lower part of the chute on which it slides down to the unit. Thereafter the lever is swung into the opposite direction back to its original position for repeating the batching operation.

3,667,620

SELF-CONTAINED UNLOADING APPARATUS

Harry Steiro, Madison, Wis., assignor to Wisconsin Foundry and Machine Company, Madison, Wis.

Filed Oct. 20, 1970, Ser. No. 82,359
Int. Cl. B60p *1/48*
U.S. Cl. 214—1 P **8 Claims**



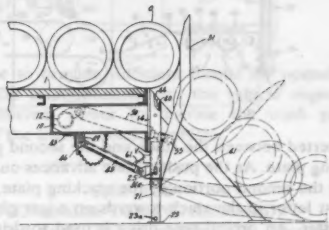
A material handling unit for detachable connection to the rear end of a vehicle and which permits gravitational unloading of heavy objects such as heavy concrete pipes from the bed of a truck. The unit is self-contained and can be easily attached to or detached from the vehicle. The unit contains its own hydraulic system including the extensible cylinders, fluid pump, reservoir and control apparatus.

3,667,621

FLUID POWER SYSTEM FOR A SELF-CONTAINED UNLOADING UNIT

Everett P. Barlow, Cambridge, Wis., assignor to Wisconsin Foundry and Machine Company, Madison, Wis.

Filed Oct. 20, 1970, Ser. No. 82,449
Int. Cl. B60p *1/48*
U.S. Cl. 214—1 P **4 Claims**



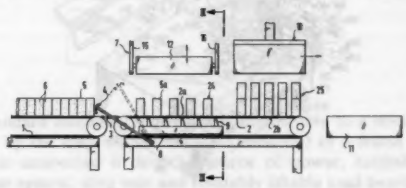
A precharged, closed circuit, fluid power system for a material handling unit which permits controlled gravitational unloading of heavy objects such as heavy concrete pipes from the bed of a truck. The system comprises extensible cylinders, fluid pump, reservoir and control apparatus.

3,667,622

METHOD OF AND MEANS FOR STACKING MOULDED ARTICLES IN GROUPS

Hermann Kamphues, Rheine, and Hans-Jurgen Rosengarten, Georgsmarienhutte, both of Germany, assignors to C. Keller & Co., Laggenbeck, Germany

Filed Jan. 5, 1971, Ser. No. 104,035
Claims priority, application Germany, Aug. 17, 1970, P 20 40 813.3
Int. Cl. B65g *57/26*
U.S. Cl. 214—6 A **5 Claims**



Moulded articles such as bricks are arranged in a plurality of aligned rows side by side on a conveyor belt. The rows are transferred to a second belt and have their spacing adjusted. The articles are then seized in a group and lifted off the belt, turned through 180° and deposited on a next group of articles to form a two-tier set-up. This is then transferred by a gripping device to a firing carriage.

3,667,623

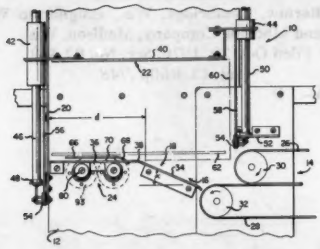
EDGER STACKER

John R. Frazier, Dayton, and Larry D. Longstreth, Wilmington, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Sept. 4, 1970, Ser. No. 69,559
Int. Cl. B65g *57/00*
U.S. Cl. 214—7 **3 Claims**

An edger-stacker apparatus for stacking letter mail on a long lower edge of the letters. The apparatus includes a pair

of input belts which deliver letters to an entry point, whence they are deflected by a first portion of a stacking plate supported on a table to a stack of letters already stacked by the apparatus. The stacking plate has a second portion upstanding from the table, which portion has an opening therein. A pusher plate passes through the second portion to push the stack of letters (already stacked) away from the second portion to provide a clearance for the next approaching letter to



be inserted between the stack and the second portion of the stacking plate. As the pusher plate advances out of the opening in the second portion of the stacking plate, it moves the nearest letter in the stack towards an edger plate to "edge" the letter. An orbital-type drive is used to drive the pusher plate and create a vibration on the table, which facilitates edging of the letters.

3,667,624

CASSETTE-TAPE SUPPLYING APPARATUS

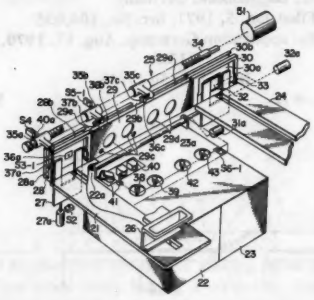
Mitsuo Ogura, Odawara, and Shinichi Fukazawa, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1971, Ser. No. 110,476

Claims priority, application Japan, Jan. 30, 1970, 45/7711

Int. Cl. B65g *60/00*

U.S. Cl. 214—8.5 A **3 Claims**



A cassette-tape supplying apparatus permitting a continuous recording or reproduction of a number of cassette tapes, which is constructed such that a number of cassettes are set upright on an input hopper and that they are fed under the upright state in the order of the first, second and third holders to be outputted from said third holder, and in which said second holder is adapted, upon swivelling, to mount said cassettes onto at least one deck.

3,667,625

DUNNAGE DEVICE

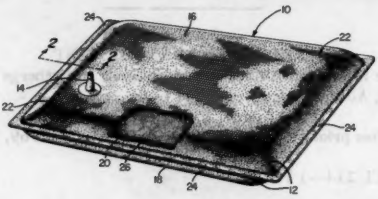
George A. Lucas, Rockmart, Ga., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 5, 1970, Ser. No. 61,161

Int. Cl. B65g *1/14*

U.S. Cl. 214—10.5 D **13 Claims**

An inflatable, bladderless dunnage device of economical construction for shoring merchandise in a storage compartment. The member includes a unitary body and valve means connected therewith. The body is formed of a laminate of pressure-retaining, flexible material including a layer or sheet of flexible polymeric material and a layer of open mesh textile fabric covering at least substantially the entire outer surface of the polymeric material layer. The polymeric material



fills the openings or interstices of the fabric layer to form a bond therewith capable of withstanding at least low to intermediate pressure when the member is inflated. Preferably the polymeric material is at least substantially air impervious and the textile fabric layer is preferably of a leno weave construction.

3,667,626

SEALING MEANS

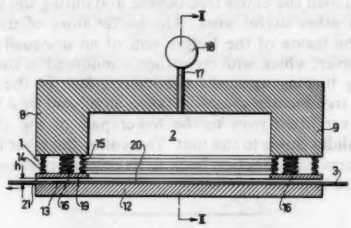
Aldo Torelli, and Andre Jacquemet, both of Grand-Lancy, Geneva, Switzerland, assignors to Sandco Limited, Ottawa, Canada

Filed July 31, 1969, Ser. No. 846,366

Claims priority, application Switzerland, Aug. 1, 1968, 115550/68; May 13, 1969, 7327/69

Int. Cl. F26b *25/00*

U.S. Cl. 214—17 B **11 Claims**



In a sealing means between two members that are movable in relation to each other, one of the members having a sealing ridge which ridge is movable towards the other of said members forming a slit therewith, the sealing ridge is provided with a surface facing said other member, said surface being parallel with the surface of said other member, means are provided for biasing the sealing ridge in the direction towards said other member.

3,667,627

FEED ARRANGEMENT FOR A COMBUSTION FURNACE

Johannes Josef Martin, and Erich Weber, both of Munchen, Germany, assignors to Josef Martin Feverungsbau GmbH, Munchen, Germany

Filed Dec. 29, 1969, Ser. No. 888,483

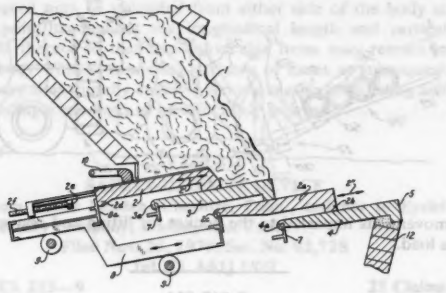
Claims priority, application Germany, Dec. 30, 1968, P 18 17 436.2

Int. Cl. B65g *25/08*; F23k *3/12*

U.S. Cl. 214—23 **9 Claims**

The lower open end of an upstanding supply chute communicates with the upper surfaces of two pairs of stepwise arranged and partly overlapping upper pushing members and

lower supporting members for transferring to the same combustible material. The respective elements are upwardly inclined relative to the horizontal and towards the furnace inlet, and with the pushing elements reciprocable relative to the supporting elements towards and away from the furnace inlet so as to stepwise displace the combustible material from the support surfaces into the furnace.



3,667,628

APPARATUS FOR LOADING PALLETS

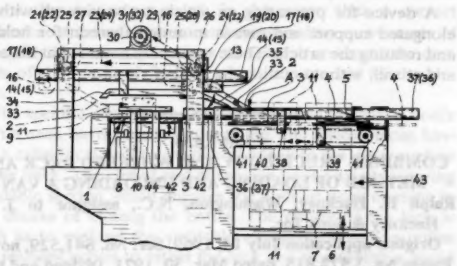
Friedrich Gabler, and Arthur Giordan, both of Stuttgart-Muhlhausen, Germany, assignors to Carl Drohmann GmbH, Stuttgart-Bad Cannstatt, Germany

Filed Jan. 26, 1970, Ser. No. 5,598

Claims priority, application Germany, Feb. 5, 1969, P 19 05 714.8

Int. Cl. B65g 57/26

U.S. Cl. 214—6 DK **3 Claims**



In an apparatus for loading pallets comprising a conveyor by which objects are introduced to the loading zone, and a ram for transferring such objects sideways on to a carrier which can be retracted to deposit the objects on to a waiting pallet, the use of a multi-part carrier associated with stop means to allow for size-adjustment and squaring-up at all four sides of an assembly of objects on the carrier.

3,667,629

CONTROL AND POWER APPARATUS FOR OPERATING TRASH COLLECTION VEHICLE PACKERS

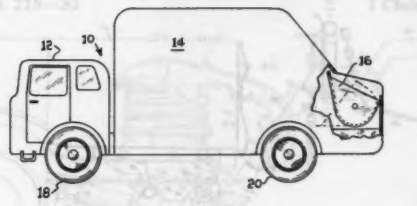
Francis X. La Voie, 2818 North 51 Street, Phoenix, Ariz.

Filed Feb. 16, 1971, Ser. No. 115,188

Int. Cl. B65f 3/00

U.S. Cl. 214—83.3 **9 Claims**

A control and power apparatus for operating trash collection vehicle packers wherein a trash collecting vehicle is provided with a chassis and wheels driven by an engine carried on the chassis and wherein emergency brakes for the wheels are manually controlled and wherein means is provided for automatically shifting the transmission of the vehicle to neutral position when the emergency brakes of the vehicle are applied; and means is responsive to the shifting of the transmission to neutral position to increase the speed of the vehicle engine to provide sufficient torque for operating a hydraulic pump in connection with the vehicle engine for delivering sufficient power to operate the trash packer mechanism of the trash collection vehicle.



3,667,630

AUTOMOBILE TOWING ASSEMBLY

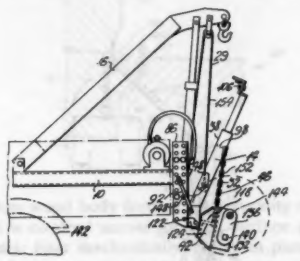
Albert Rockwood Scott, 287 Wychwood Ave, Toronto, Ontairo, Canada

Continuation of application Ser. No. 808,414, Mar. 19, 1969, now abandoned. This application July 20, 1970, Ser. No. 64,016

Claims priority, application Great Britain, Mar. 21, 1968, 13,638/68

Int. Cl. B60p 3/12

U.S. Cl. 214—86 A **16 Claims**



A standard automobile or truck is convertible to a towing vehicle by the easy installation (and removal) of a frame to which is connected a derrick, source of power, rotatable draw-bar system, sling unit and rotatably liftable load bearing towing wheel arrangement which is lockable in lowered operating position and elevated by the rotation into the vertical out-of-use position of said draw system.

3,667,631

HYDRAULIC UTILITY LIFT FOR TRUCKS

Jerald W. Bishop, 1506 Highway 56, Dodge City, Kans.

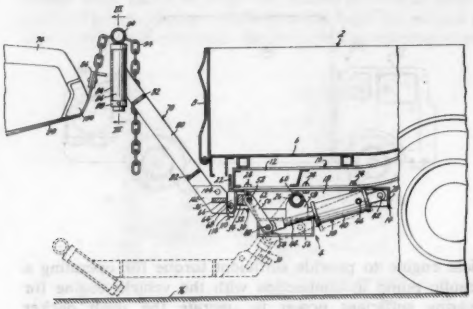
Filed Jan. 22, 1971, Ser. No. 108,777

Int. Cl. B66c 1/00; B66f 3/00

U.S. Cl. 214—86 A **8 Claims**

A hydraulic utility lift for pick-up trucks and other vehicles consisting of a frame adapted to be mounted under the rear portion of the truck bed and carrying a lift arm operable to lift a load disposed rearwardly of said truck as said arm is pivoted from a downwardly and rearwardly inclined position to a substantially horizontal position, a hydraulic ram for pivoting said arm, and a linkage operatively connecting said ram to said arm, said linkage having a novel arrangement whereby it both converts horizontal movements of said ram

to vertical movement lifting said arm, whereby said ram may be elevated to preserve better ground clearance for said lift,

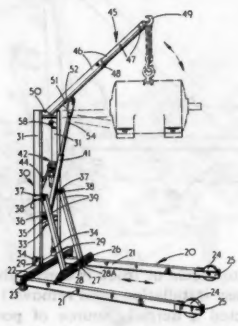


and also provides a more uniform power ratio for said ram, permitting economies in the design of said ram.

3,667,632
FLOOR CRANE

Anthony Clifford Tidswell, 18, Nene Road, Huntingdon, Huntingdonshire, England

Filed Jan. 16, 1970, Ser. No. 3,541
Claims priority, application Great Britain, Jan. 21, 1969, 3,391/69
Int. Cl. B66c *23/00*
U.S. Cl. 214—130 R **2 Claims**



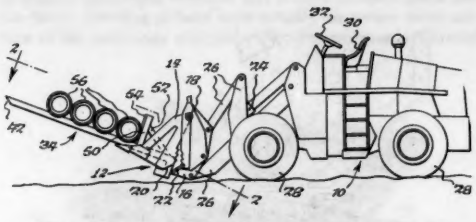
A floor crane having a wheeled base with an upright support pivoted to one end thereof, a jib pivoted to the upper end of the upright support and a fluid ram interconnecting the upright support and jib such that the upright support can be disposed parallel with the base with the jib and fluid ram substantially disposed therebetween.

3,667,633
FORK LIFT ATTACHMENT

Michael Cappella, Lancaster, N.Y., assignor to Sergi Bros., Inc., Depew, N.Y.

Filed July 29, 1970, Ser. No. 59,184
Int. Cl. B66f *9/00*
U.S. Cl. 214—145 **4 Claims**

A pair of fork lift elements are clamped at their rear ends in laterally spaced relation between pivotal segments of a bucket mounted on an earth handling apparatus. The bucket thereby is quickly converted to a fork lift having all the

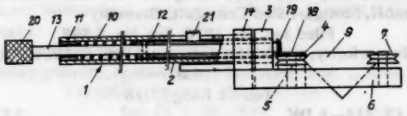


movements imparted to the bucket for lifting and conveying a load.

3,667,634
INSTRUMENT FOR PRESENTING AN OBJECT TO BE VIEWED

Raymond-Gerard Potterat, 6, Avenue des Alpes, 1006 Lausanne, Vaud, Switzerland

Filed Sept. 30, 1970, Ser. No. 76,775
Claims priority, application Switzerland, Oct. 1, 1969, 13248/69
Int. Cl. B65g *7/00*
U.S. Cl. 214—340 **10 Claims**

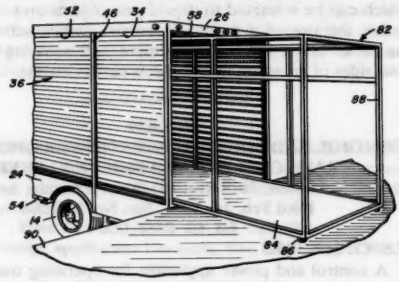


A device for presenting an article to be viewed, with an elongated support and means mounted thereon for holding and rotating the article. These means are actuated at distance and at will, without cutting the field of view.

3,667,635
COMBINED TRUCK BODY AND WHEELED RACK AND METHOD OF LOADING AND UNLOADING A VAN

Ralph H. Hackney, Washington, N.C., assignor to J. A. Hackney & Sons, Inc.

Original application July 14, 1969, Ser. No. 841,529, now Patent No. 3,572,815, dated Mar. 30, 1971. Divided and this application Dec. 3, 1970, Ser. No. 94,866
Int. Cl. B60p *1/64*
U.S. Cl. 214—515 **2 Claims**



A combined van type truck body and a wheeled rack or cart of a size commensurate with the internal dimensions of

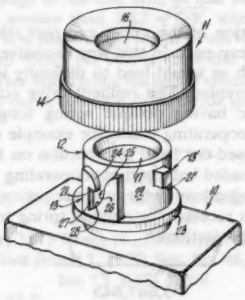
the body to be loaded into or removed from the body through rear access doors with the body also including roll-up type overhead doors along each side thereof to enable access to both longitudinal sides of the rack or cart throughout the longitudinal dimension thereof so that items to be delivered may be unloaded from either side of the body at any point throughout the longitudinal length and vertical height thereof so that non-deliverable items may remain in the body without hindering delivery of items at subsequent delivery sites thereby enabling a novel method of loading and unloading a van body to be effectively practiced.

3,667,636

SAFETY-CLOSURE DEVICE

William James Landen, Cheshire, Conn., assignor to Eyelet Specialty Company, Wallingford, Conn.

Filed Nov. 25, 1970, Ser. No. 92,728
Int. Cl. A61j *1/00*
U.S. Cl. 215—9 **21 Claims**



The invention contemplates selectively openable closure means that is tamper-proof, in the sense that a correct sequence of two deliberate and independent movements of two parts is necessary in order to achieve access to the contents of the bottle or the like which is protected by the closure.

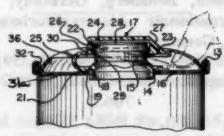
The specific construction that is described involves a bottle with a neck having a circular opening, and a closure cap having a cylindrical wall to overlap and lock to the outer surface of the neck. The closed end of the cap has an axially tapering yieldable section which engages the circular neck opening in the course of closing the bottle. The nature of the lock is such as to preload the yieldable engagement and to utilize the resilient action to retain the lock and to establish a liquid seal of the bottle contents.

3,667,637

SAFETY DEVICE FOR FLIP CAP CLOSURE

Richard B. Bagguley, Dolton, and Carmen T. Mascia, Westchester, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,573
Int. Cl. A61j *1/00*; B65d *55/02*
U.S. Cl. 215—9 **4 Claims**



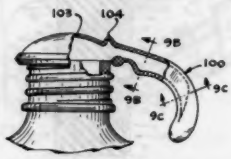
A flexible safety shield for preventing the opening of a flip cap closure until the shield is depressed.

3,667,638

LEVER OPENED SEALED CONTAINER

Orlando D. Cambio, Jr., Chicago, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 11, 1969, Ser. No. 884,086
Int. Cl. B65d *1/02*
U.S. Cl. 215—32 **1 Claim**



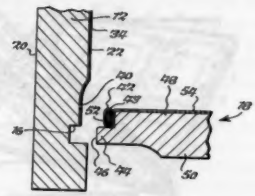
In containers having an integrally molded cap and sealing web, an integral handle, preferably on the mold parting line and extending from the cap, enables cap removal with low force. A fulcrum, within or without the container, cooperates with the handle to open the container.

3,667,639

LINED HOLLOW WOOD BODY

Arthur P. Pfeil, Akron, N.Y., assignor to Arrow Tank Company Inc., Buffalo, N.Y.

Filed June 30, 1970, Ser. No. 51,122
Int. Cl. B65d *9/00*, *9/34*
U.S. Cl. 217—4 R **6 Claims**



A lined hollow wood body formed of a plurality of staves, each of which is covered across its inner surface and edge faces by a plastic liner mechanically locked in place by the mating edges of adjacent stave sections. A bottom wall having a plastic liner on the inner surface thereof is secured to the inner side of the body in a fluid tight relation. Also, an annular seal is interposed between an annular shoulder on the bottom wall and the inner side of the body to form a second sealing means therebetween.

3,667,640

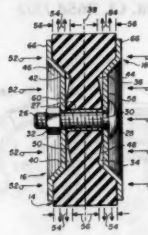
CONDUIT PLUG

Joseph G. Morrow, P. O. Box 211, East Paterson, N.J.

Continuation of application Ser. No. 778,499, Nov. 25, 1968, now abandoned. This application July 13, 1970, Ser. No. 56,215
Int. Cl. B65d *39/12*
U.S. Cl. 220—24.5 **6 Claims**

A plug assembly for sealing the open end of a conduit, which assembly includes a resilient plug on the opposite sides of which are disposed a pair of plates which are drawn toward one another to apply pressure to the plug sandwiched therebetween. Under pressure, the plug expands into sealing relationship with the interior of the conduit. The plug includes angularly oriented side surface areas which are engaged by similarly oriented portions of the side plates such that pressure developed between the plates is laterally distributed across the thickness of the plug whereby an area

contact of engagement can be established between the perimeter of the plug and the interior of the conduit. Alternatively, or in addition thereto, a central side surface of the plug is concavely bowed with respect to a central plane



thereof such that a flat central mating portion of the cooperating plate member, when applied thereto, will establish an area contact of engagement between the central portion of the thickness of the perimeter of the plug and the interior of the conduit.

3,667,641

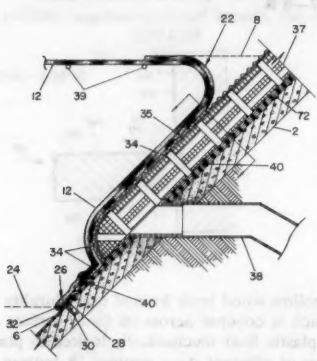
RESERVOIR COVER ARRANGEMENT

Howard S. Dial, Valley Crest Rd., Lebanon, N.J.

Filed Mar. 2, 1970, Ser. No. 15,439

Int. Cl. B65d *87/18*

U.S. Cl. 220—26 S **4 Claims**



A reservoir is provided with a flexible, floating, cover secured to the sides of the reservoir along a line located between the anticipated upper and lower levels which water or other liquid in the reservoir may assume whereby the cover will remain in contact with the surface of the liquid as its level fluctuates up and down. A drain extending through the wall of the reservoir is arranged to draw off any rain or melted snow accumulating on the upper surface of the cover.

3,667,642

SCREW-ON CLOSURE MEMBERS FOR CONTAINERS, ETC.

Werner Blau, and Theo Gerdes, both of Langenfeld/Rhineland, Germany, assignors to Blau KG Fabrik Fur Kraftfahrzeugteile, Langenfeld-Immigrath/Rhineland and Volkswagenwerk AG(Wolfsburg, Germany

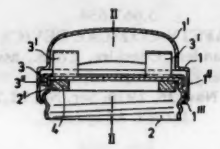
Filed Dec. 2, 1970, Ser. No. 94,410

Claims priority, application Germany, Dec. 3, 1969, P 19 60 674.7

Int. Cl. B65d *41/04*

U.S. Cl. 220—39 R **15 Claims**

A screw-on closure cap for closing the filling opening of a container or a tubular spout, the cap comprising relatively rotatable upper and threaded lower cap parts assembled together coaxially and having a resilient drive connection between them capable of transmitting a predetermined maximum torque between the upper and lower cap parts in the closing direction. When during the screwing on of the cap onto the neck of a container or filling spout by the manual application of closing torque to the upper cap part, directly the closure cap reaches a certain degree of tightness on the cooperating part of the container or spout such that the predetermined transmitted closing torque is exceeded, the resilient drive connection yields ratchetwise to allow the con-



tinued free rotation of the upper cap part relatively to the threaded lower cap part. In this way excessive tightening of the closure, such as would lead to difficulty in loosening it manually, is prevented. The resilient drive connection may comprise a disc having oblique spring tongues engaging ratchetwise in cooperating recess for example in the interior of a hollow pressed-out hand grip portion on the upper cap part; or spring-loaded ball catches cooperating with recesses; or dog-like projections with oblique or rounded faces cooperating with recesses; or oblique spring tongues engaging behind rigid projections.

3,667,643

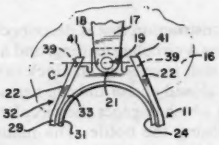
EASY-LIFT PULL TAB

Anilkumar J. Patel, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,694

Int. Cl. B65d *17/20*

U.S. Cl. 220—54 **3 Claims**



A pull tab for an easy opening container. The pull tab is of the type having a pair of fulcrum legs. The fulcrum legs are each formed with an extension of single layer of sheet metal which projects outwardly of the fulcrum ends of the legs.

3,667,644

REVERSING RUPTURE DISC FOR PROTECTING EQUIPMENT FROM EXCESSIVE PRESSURE AND METHOD OF MANUFACTURE

Manfred Fortmann, Bensberg, Germany, assignor to Interatom Internationale Atomreaktorbau GmbH, Bensberg/Cologne, Germany

Filed May 22, 1970, Ser. No. 39,781

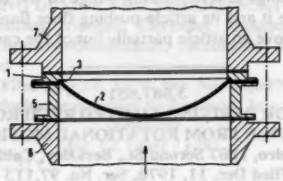
Claims priority, application Germany, May 24, 1969, P 19 26 706.2

Int. Cl. B65d *25/00*

U.S. Cl. 220—89 A **14 Claims**

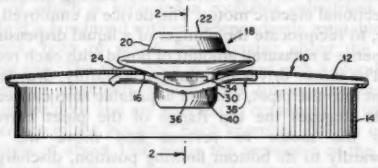
A reversing rupture disc assembly for protecting a vessel or other apparatus from excessive pressure has a carrier ring mountable in the apparatus and a reversing rupture disc tightly positioned in the ring. The disc has a curvature obtained by imparting a force thereto so as to strain the materi-

al from which the disc is made. The disc is disposed in the ring, so that the convex surface of the disc is directed toward the pressure. The disc has a weak buckling zone located in the mid-region of the disc, whereby the disc buckles inwardly and ruptures in response to the excessive pressure, the disc deviating from a spherical form at the mid-region, so that the radius of curvature of the disc decreases going from the mid-



region to the edge of the disc and, so that the sector angle ϕ of the disc is greater than $3.82\sqrt{S/R}$, where S is the disc thickness and R is the average radius of curvature of the disc. The material of which the disc is made has a positive stress-strain curve after undergoing the strain required to obtain the curvature, the curve having a slope $d\sigma/d\epsilon$ greater than about 100 kgf/mm².

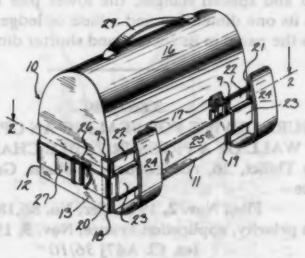
3,667,645
COVER AND KNOB ASSEMBLY FOR A COFFEE PERCOLATOR
Milton Emmer, 2171 Bragg St., Brooklyn, N.Y.
Filed June 17, 1970, Ser. No. 46,896
Int. Cl. A47j *31/04*
U.S. Cl. 220—82.5 **9 Claims**



A cover and knob assembly for a coffee percolator; the cover having an opening for the knob. The knob comprises a hollow body closed at one end and open at its other and has its closed end section projecting from and overlying the edges of the cover opening and its open end section extending through the cover opening. The open end section has oppositely laterally facing detent projections at its bottom. A U-shaped spring clip having arcuate sides with the altitude of the arcs greater than the distance between the projections and the underside of the cover, supported on the projections by the convex edges of the arcuate portions of its sides, with the ends of the sides resiliently pressing against the underside of the cover.

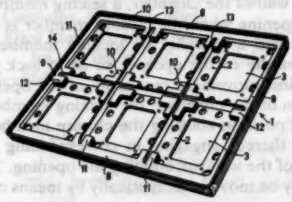
3,667,646
AUXILIARY CARRIER FOR PORTABLE BOXES
Edwin H. Graf, W187, 56876 Jewel Crest Drive, Muskego, Wis.
Filed Aug. 21, 1970, Ser. No. 65,967
Int. Cl. B65d *25/00*; A45c *13/40*
U.S. Cl. 220—85 R **3 Claims**

A pair of corner brackets are removably strapped to spaced corners of the main body portion of a lunch box, each bracket having an upwardly projecting yielding clip whereby an elongated item may be releasably held by the clips in a



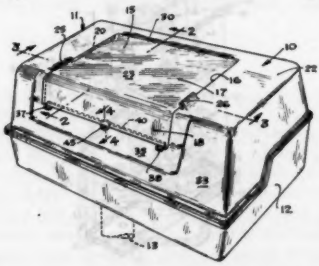
position close to the body of the lunch box and extending longitudinally thereof below the cover.

3,667,647
HOLDER FOR A NUMBER OF ASSOCIATED INDIVIDUAL CONTAINERS
Leendert Van Daalen, Slikkerveer, Netherlands, assignor to N. V. Plastic Industrie Van Daalen, Sliedrecht, Netherlands
Filed Mar. 18, 1970, Ser. No. 20,741
Claims priority, application Netherlands, Mar. 26, 1969, 6904643
Int. Cl. B65d *69/00, 21/02*
U.S. Cl. 220—23.4 **5 Claims**



A stackable holder for a number of individual containers, for vegetables and fruit, with a plate which carries the containers by their bottom and is provided with openings and raised parts to ventilate the contents of the containers.

3,667,648
SLIP OUT GLASS PANEL FOR COVER MEMBER
Walter Koziol, Russell, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed July 6, 1970, Ser. No. 52,390
Int. Cl. B65d *43/12*
U.S. Cl. 220—41 **9 Claims**



A cover member for a cooking unit wherein a panel can be inserted and removed without fastening means or the

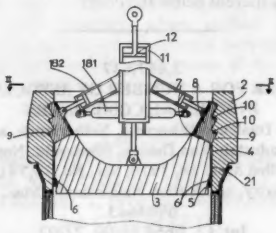
removal or the moving of any parts in the cover member. A frame is provided with an opening to receive a panel which is formed in two different planes and preferably, substantially L-shaped. The frame contains two pairs of oppositely disposed and spaced flanges, the lower pair supporting the panel in its one dimension and a base or ledge portion which supports the panel in its second and shorter dimension.

3,667,649

CLOSURE DEVICE FOR SEALING AN OPENING IN A WALL OF A PRESSURIZABLE CHAMBER

Georges Thillet, 26, rue Edouard Valliant, Grenoble (Isere), France

Filed Nov. 2, 1970, Ser. No. 86,182
Claims priority, application France, Nov. 5, 1969, 6938066
Int. Cl. A47j *36/10*
U.S. Cl. 220—55 Y **5 Claims**



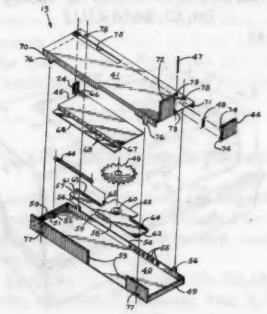
The combination of a pressurizable chamber and a closure device comprised of a closure member operable to close an opening in a wall of the chamber, a sealing member operable to seal the opening when the closure member is disposed in the opening and a plurality of locking members movable radially outwardly of the opening so as to lock the closure member against movement outwardly of the opening due to pressurization of the chamber; the locking members when in their locking position abutting the closure member and having portions thereof engaging in corresponding recesses in that portion of the wall surrounding the opening. The locking members may be moved automatically by means of jacks.

3,667,650

DISPENSING PACKAGE AND SUBASSEMBLY THEREFOR

Ricardo Noda, 802 Zenobia St., Denver, Colo., and Manuel R. Espino, Apt. 2, 277 Silver Ct., Elgin, Ill.

Continuation-in-part of application Ser. No. 820,825, May 1, 1969, now Patent No. 3,558,008. This application Dec. 21, 1970, Ser. No. 100,173
Int. Cl. B65g *59/06*
U.S. Cl. 221—250 **12 Claims**



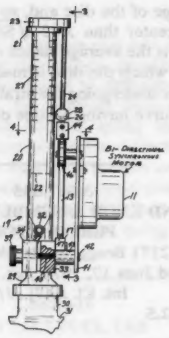
A dispensing package has a casing from which packaged articles are partially removed in sequence by each cycle of the operation within the casing of components of a subassembly with a base plate and a cover plate connected to each other but spaced apart. One of two shorter plates of the subassembly has a lateral extension that passes out a longitudinal slot in the casing for external manual movement of that plate. That shorter plate has an intermediate boss rotatably mounting a gear that is also rotated during this movement relative to the base plate by engagement seriatim with dents in a flange of the base plate. Diagonally opposite that engagement the gear during rotation and linear movement engages seriatim openings in a depending flange of the other shorter plate to move it and its article-pushing finer flange a greater distance to move an article partially out of the casing.

3,667,651

DEVICE FOR DERIVING LIMITED RECIPROCATING MOTION FROM ROTATIONAL MOTION

Justin J. Shapiro, 1802 Second St., Berkeley, Calif.

Filed Dec. 11, 1970, Ser. No. 97,113
Int. Cl. B67d *5/08*; **F16d** *71/00*
U.S. Cl. 222—63 **13 Claims**



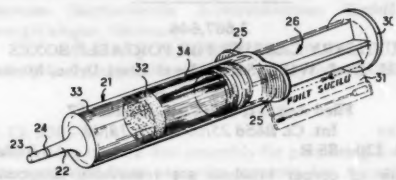
A device for deriving limited reciprocating motion from a bi-directional electric motor. The device is employed, for example, to reciprocate the plunger of a liquid dispensing pipet to dispense a measured amount of liquid with each reciprocation. The motor drives the plunger upwardly, drawing liquid reagent into the pipet, until an adjustable stop carried by the plunger engages the top flange of the pipet barrel. This causes the motor to reverse and move the plunger downwardly to its bottom limiting position, discharging the measured amount of reagent into a collection receptacle.

3,667,652

METHOD AND APPARATUS FOR SEPARATELY PACKAGING TWO LIQUIDS WHICH ARE TO BE SIMULTANEOUSLY DISPENSED

Bruno Morane, Paris; Manlio Maurelli, Vaujours; Charles Paoletti, Aurinay Sous Bois; Louis Merrien, Fontenay Sous Bois, and Robert Sathicq, Villepinte, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 1, 1969, Ser. No. 881,081
Claims priority, application France, Dec. 10, 1968, 177518; May 13, 1969, 6915369
Int. Cl. B67d *5/60*
U.S. Cl. 222—145 **21 Claims**



Two liquids are stored in a single jacket on opposite sides of a plug of compressible material. The fluids are mixed by

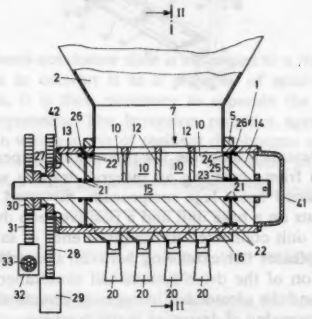
applying fluid pressure to compress the plug and the mixture is then dispensed through a valve or nozzle in the jacket. The pressure may be supplied by actuating a piston or by releasing a compressed fluid into the jacket, or both.

3,667,653

DOSAGING DEVICE FOR VISCOUS SUBSTANCES

Horst Loewenthal, Tiengen, Germany, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed July 15, 1970, Ser. No. 55,087
Claims priority, application Switzerland, July 16, 1969, 10861/69
Int. Cl. G01f *13/00*
U.S. Cl. 222—217 **1 Claim**



The dosaging device comprises rotary slide valve in the housing of which is arranged a rotatable cylindrical main cock which is combined with an independently rotatable auxiliary cock, both of which are rotatable about the same horizontal axis. The main cock is provided with a plurality of axially alined chambers which open toward the circumference of the cock and are adapted to communicate with an inlet aperture in the housing. Each chamber extends over a sector angle of about 180° along the perimeter of the main cock. In each chamber extends a displacement sector extending over a sector angle of 90° and forming a part of the auxiliary cock whose other part is formed by a shaft about which the main cock is rotatable relatively to the auxiliary cock. The housing has two parallel rows of outlet apertures connectable with the containers which receive the dosages expelled by the cooperation of the two cocks from the chambers in the main cock.

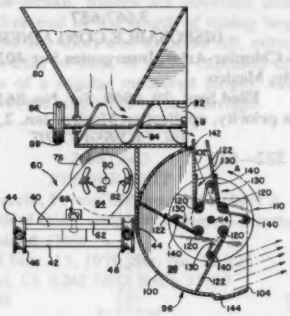
3,667,654

MATERIAL APPLICATOR DEVICE

Percy Ray Holley, 1507 Siegfried St., Victoria, Tex.

Filed May 21, 1970, Ser. No. 39,317
Int. Cl. G01f *11/20*
U.S. Cl. 222—336 **5 Claims**

A support is rotatably mounted within a housing one side of which is open. A plurality of propelling arms are each swingably mounted by the support and are resiliently biased in one direction. The support is rotated during operation to cause the arms to be alternately cocked and released to propel material onto a suitable surface. Feed means is provided for feeding material to the propelling arms and the device is adjustable both in elevation and azimuth. In addition, a moveable framework is provided which enables the



applicator device to be adjusted in both vertical and horizontal directions.

ERRATUM

For Class 222—412 see:
Patent No. 3,667,665

3,667,655

METHOD FOR THE RAPID ASSEMBLY OF DIPTUBES INTO SPRAY CANS AND A DIPTUBE USEFUL THEREIN

Herman Knieriem, Jr., Ballwin, Mo., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 30, 1970, Ser. No. 23,600
Int. Cl. B67d *5/60;* **B65b** *3/04*
U.S. Cl. 222—464 **12 Claims**

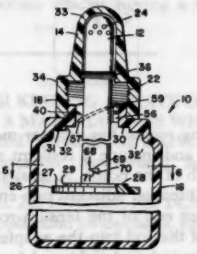
Method for the rapid assembly of long flexible diptubes into spray cans wherein the diptube is fixed into a coiled configuration prior to its insertion into the spray can and regains its normal shape after assembly.

3,667,656

EXTENSIBLE SPOUTS FOR CONTAINERS

John J. De Putron, 5098 Seven Oaks Station, Detroit, Mich.

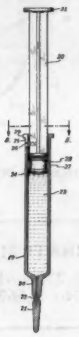
Filed Sept. 17, 1969, Ser. No. 858,726
Int. Cl. B67d *3/00*
U.S. Cl. 222—524 **16 Claims**



A container having an extensible dispensing spout. A cap is removably secured to the container and to the spout to seal

the spout within the container in retracted position and to be used for extending the spout without touching it by hand.

3,667,657
DISPOSABLE CONTAINER
Marcelo Chiquiar-Arias, Insurgentes Sur 403 1st Floor, Mexico City, Mexico
Filed Sept. 29, 1969, Ser. No. 861,841
Claims priority, application Mexico, Jan. 2, 1969, 108027
Int. Cl. B65d *47/10*
U.S. Cl. 222—541 5 Claims

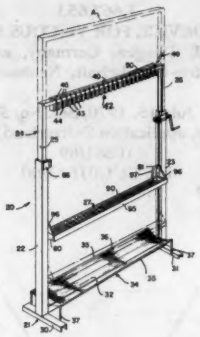


A prophylactic, dosified, disposable syringe includes a container comprising a cylinder composed of material capable of being cut, a piston operable in the cylinder for expelling the contained dosage, and means operable upon ejecting movement of said piston for cutting the wall of the cylinder to preclude reuse thereof.

3,667,658
LIQUID DISPENSER WITH SEPARABLY ATTACHED MEASURING DEVICE
Robert William Young, Cheltenham, England, assignor to Autic Developments Limited, Cheltenham, England
Filed June 1, 1970, Ser. No. 42,261
Claims priority, application Great Britain, May 31, 1969, 27,680/69
Int. Cl. B65d *5/72*
U.S. Cl. 222—569 4 Claims

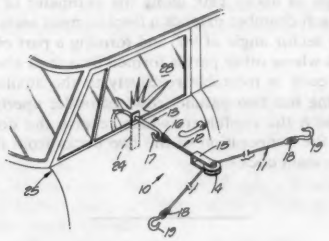
The connecting means has adapter means for attachment to the measure and include a resilient seal for engagement within the mouth of the bottle. A tension rod passes through the seal and is threaded adjacent one end to carry clamping means. The other end of the tension rod has means which limit insertion of the rod into the adapter means and enable the rod to be turned and tightened by a cooperating key, whereupon the clamping means clamp against the inside of the bottle and provide positive retention to prevent withdrawal of the seal from the mouth of the bottle except by releasing the clamping means using said key.

3,667,659
TELESCOPING DRAPERY PROCESSING MACHINE
Vernon D. Clement, P. O. Box 9922, Sacramento, Calif.
Filed May 17, 1971, Ser. No. 143,905
Int. Cl. A41h *43/00*; D06j *1/00, 1/10*
U.S. Cl. 223—32 11 Claims



A low clearance machine for processing draperies has an upper rigid frame carrying an integral drapery support bar with its spaced apart legs reciprocally mounted in upright support posts on a base unit and a positive loop drive system in the base unit connected to the distal ends of said legs and a drapery pleater bar extending between the posts whereby the operation of the drive system will simultaneously move the frame and the pleater bar in opposite directions for quick efficient processing of draperies in the machine.

3,667,660
EMERGENCY VEHICLE RESCUE DEVICE AND METHOD
Bruce B. Lewis, 12623 Stillman St., Lakewood, Calif.
Filed Dec. 15, 1969, Ser. No. 885,242
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 8 Claims

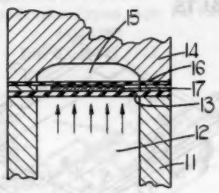


An emergency rescue device and method of releasing an accident victim trapped in a vehicle by locked or jammed doors. The device comprises powerful hook means on one end of a flexible draft line, the hook means being usable to smash the door window for engagement of the hook over the window sill. The free end of the draft line is attachable to another vehicle and used to deform or smash the door instantly for withdrawal of the victim for emergency treatment or from fire or explosion hazards. A supplemental or snubbing draft line movably attached to the main draft line can be attached to a fixed anchorage thereby enabling a rescue vehicle to apply a pulling force along a line at an angle to the pulling force acting on the door being opened.

3,667,661
APPARATUS FOR USE IN THE MANUFACTURE OF SEMI-CONDUCTOR DEVICES

Francis Louis Farmer, 106 Holifast Rd, Sutton Coldfield, Warwickshire, England

Filed Apr. 8, 1970, Ser. No. 26,734
Claims priority, application Great Britain, May 1, 1969, 22,180/69
Int. Cl. B26f 3/00
U.S. Cl. 225—2 5 Claims

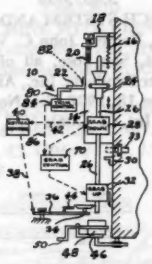


When a semi-conductor slice is subjected to a manufacturing process to convert it to a plurality of semi-conductor components, it is then necessary to separate the semi-conductor components. The invention provides apparatus for doing this in which a pair of resilient diaphragms are used to sandwich the wafer, the diaphragms then being distended to crack the slice along previously scribed lines.

3,667,662
CAPILLARY TUBE CUTTING AND FEEDING APPARATUS

Saul R. Gilford, and Ignacio P. Echeagaray, both of Oberlin, Ohio, assignors to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Filed Aug. 18, 1969, Ser. No. 850,884
Int. Cl. B26f 3/00
U.S. Cl. 225—96.5 7 Claims

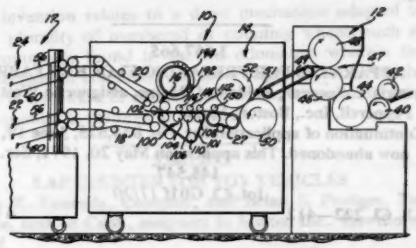


A length of capillary tubing is mounted to an apparatus, being carried by a reciprocable carriage and a fixed support serving as a guide. The carriage and support have releasable unilateral respective first and second grab means. The grab means are effective in opposite directions of axial movement of the length of tubing so that movement of the carriage toward the support will hold the length of tubing on the carriage but permit the length to slip past the second grab means, but upon return movement of the carriage the second grab means locks the length in position and the first grab means permits slipping movement of the length of tubing relative to the carriage. In this manner a forward stroke of the carriage will feed a length of tubing past the support and a return, or rearward stroke will return the carriage without concurrent movement of the length of tubing. The length fed, at most equals the length of the forward stroke, but can be varied by suitable means, for example, for the purpose of feeding a small end for trimming. A cutter is driven by and synchronized with return movement of the carriage to score the fed length of tubing. The apparatus includes means supporting a cuvette or carrier into which the tubing end is inserted during the stroke. Means are provided laterally to strain the short free end of the length of tubing beyond the score line to cause the short end to break off, either falling into waste in the case of trim, or being captured in the cuvette in the case of a regular measured length. Means are provided to control the length fed by the carriage.

3,667,663
FEEDER UNIT

Thomas J. Kacmarcik, Parma Heights, and Robert K. Norton, Twinsburg, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 13, 1970, Ser. No. 19,221
Int. Cl. B26f 3/00; B65h 35/00
U.S. Cl. 225—100 7 Claims



An improved apparatus for processing a stream of articles formed from sheet material with the articles arranged in interconnected rows extending transverse to the direction of movement of the articles includes a first means for transporting the articles at a first speed and a second means for receiving the articles from the first means and conveying the articles at a second speed which is in excess of the first speed. The second means for receiving the articles includes a conveyor unit and a plurality of rollers operatively associated with the conveyor unit and each of which have an article conveying position and an inactive position in which the roller does not cooperate with the conveyor to convey the articles. Means are provided for selectively moving at least one of the rollers between its positions so that the one roller may engage with one of the transversely extending rows of articles as the trailing edge of that row of articles passes from the first means. The one row of articles is then speeded up relative to the next successive row of articles which is engaged with the first means to thereby disconnect the one row from the next row of articles to thereby space the one row of articles relative to the next successive row of articles so as to facilitate processing of the articles as they move through the apparatus. The selective operation of the one roller enables the apparatus to process articles having a wide variety of configurations.

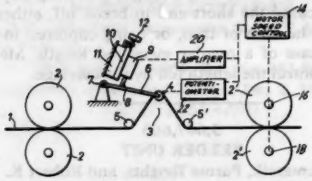
3,667,664
APPARATUS FOR KEEPING A STATE OF TENSION CONSTANT ON A MATERIAL WEB WHICH RUNS BETWEEN SUCCESSIVE PAIRS OF DRIVING ROLLERS

Peter Schroeder, Stockacker, Switzerland, assignor to Paul Weber A.G., Rothrist, Switzerland

Filed Feb. 26, 1970, Ser. No. 14,508
Claims priority, application Switzerland, Feb. 28, 1969, 3016/69
Int. Cl. B65h 43/00
U.S. Cl. 226—30 6 Claims

An apparatus for keeping a state of tension constant on a material web which runs between successive pairs of driving rollers includes a torsion bar having a lever extension with a

guide roller over which the material is directed. Sensing means are associated with the lever to sense variations of the torsion acting on the bar through the displacement of the lever by the variations in tension of the material which is



being fed and this sensing means is connected to electrical control means for varying the speed of one or the other set of rollers or for braking the speed of one of the sets of the rollers in order to vary the tension on the web material which is fed.

3,667,665

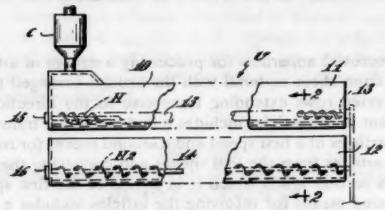
APPARATUS FOR PREPARING FLOCKED FABRIC

Francis T. Spencer, Biddeford, Maine, assignor to West Point-Pepperell, Inc., Boston, Mass.

Continuation of application Ser. No. 834,825, June 19, 1969, now abandoned. This application May 20, 1971, Ser. No. 145,547

Int. Cl. G01f *11/20*

U.S. Cl. 222—412 **4 Claims**



Flock distributing apparatus of the kind which comprises an elongate receptacle for flock, said receptacle having a foraminous bottom, an elongate rotary agitator within and extending longitudinally of the receptacle and which is operative to cause flock fiber to sift down through the bottom of the receptacle, and with further provision of means operative to drop flock down onto the rotary agitator at definitely spaced points lengthwise of the latter.

3,667,666

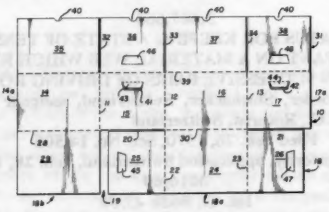
FOLDABLE STORAGE BOX

James T. Pryor, Dallas, Tex., assignor to Perma Products Co., Dallas, Tex.

Filed Dec. 30, 1970, Ser. No. 102,847

Int. Cl. B65d *5/00*

U.S. Cl. 229—16 B **3 Claims**



A storage box is disclosed that is folded into a box from a single flat blank of material in such a manner that the resultant box has three-ply end walls and two-ply side walls.

3,667,667

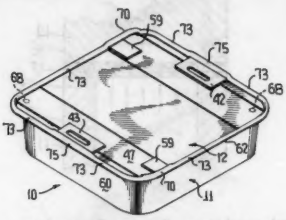
DOUBLE BOILER AND THROW-A-WAY FOOD PACKAGE

Henry E. Frankenberg, Berwyn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 15, 1970, Ser. No. 98,305

Int. Cl. B65d

U.S. Cl. 229—51 TS **14 Claims**



This disclosure relates to an improved container particularly of the so-called double boiler type, in which a cover is secured to the container body by an overfolded or crimped peripheral edge of the latter. Between adjacent side edges of the cover an edge of the periphery thereof is inwardly offset and in this area the cover is not crimped to the container but is actually spaced slightly from the crimp which serves as a vent for steam when the container contents are heated. Moreover, at this same area there is located the starting end of a tear strip portion, and since the latter is not secured to the container by the crimp, the starting end can be easily gripped and the tear strip portion readily removed to gain access to the container contents.

3,667,668

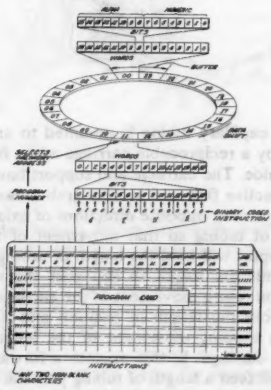
CARD PUNCH SYSTEM AND PROCESS

Clarence G. McCune, Balboa; John C. Vincer, Anaheim, and Kenneth E. Graves, San Jose, all of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed June 18, 1970, Ser. No. 47,215

Int. Cl. G06k *1/18*

U.S. Cl. 234—15 **21 Claims**



The time required to punch IBM cards can be reduced by using a memory for storing a large number of programs. The card reading capability of a conventional keypunch machine

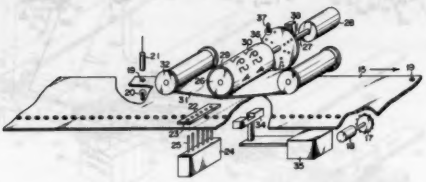
can be used to load the program information. The memory can also be used to store keystroke data while the system is executing automatic operations.

3,667,669

APPARATUS FOR PREPARING A PRINTED AND PUNCHED CARD

Etsuro Nagata, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 10, 1970, Ser. No. 27,408
Claims priority, application Japan, Apr. 14, 1969, 44/28383; 44/28382
Int. Cl. B41j *5/42*
U.S. Cl. 234—24 **10 Claims**



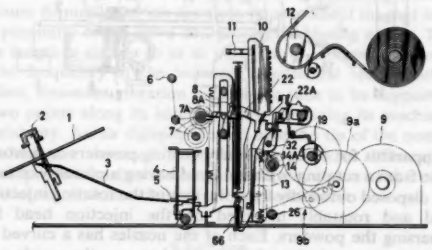
An apparatus for preparing a printed and punched card comprising a readout means for reading out signals representing information punched in a tape, a letter signal generating means for generating letter signals corresponding to the types successively passing through a printing section, a printing means for printing in two rows by a double-faced hammer with a paper card interposed therebetween, a punching means for punching the paper card by the vertical movement of a punching rod and a control device for actuating both printing and punching means at the same time when the letter signals are exactly identified with the information signals.

3,667,670

ADDING MACHINE WITH PRINTING DEVICE

Masaki Okajima, Yokohama, and Ryuzaburo Yokoyama, Urawa, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1970, Ser. No. 89,308
Claims priority, application Japan, Nov. 14, 1969, 44/91040
Int. Cl. G06c *27/00*, *15/48*
U.S. Cl. 235—60 MT **6 Claims**



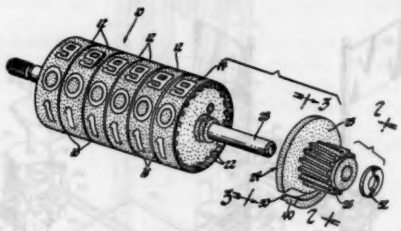
In a printing adding machine having a totalizer comprising a set of pinions cooperating with a set of racks, a second totalizer is provided for storing a number which is the sum of totals stored in the first totalizer. The second totalizer comprises a second set of pinions cooperating with a second set of racks which are connected to the first set of racks for upward and downward movement therewith.

3,667,671

ANTI-REVERSE ODOMETER ONE-WAY DRIVE

Guenter Hachtel, Swartz Creek, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1970, Ser. No. 65,791
Int. Cl. G01c *22/00*
U.S. Cl. 235—96 **3 Claims**



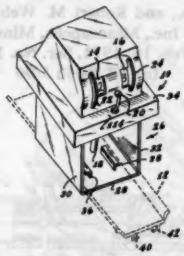
This invention relates to a drive mechanism adapted to drive a plurality of numbered or counting wheels such as those commonly found in use on odometers wherein the drive mechanism comprises a flexible finger which drives the counter in a forward or counting direction, but prevents driving the counter in the reverse direction.

3,667,672

LAP COUNTER FOR TOY VEHICLES

Melvin R. Kennedy, Compton, and Brian S. Prodger, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Continuation of application Ser. No. 812,736, Apr. 2, 1969, now abandoned. This application Jan. 28, 1971, Ser. No. 110,673
Int. Cl. B61l *1/16*; G06m *1/08*
U.S. Cl. 235—98 B **16 Claims**



A device for placement on a toy racing track to count the number of laps traversed by a toy vehicle, comprising a spring loaded lever extending into the path of the vehicle that advances counting wheels which display the count. The deflection of the lever by the toy vehicle winds the spring, and the advance of a counting wheel occurs only on the return of the lever, so that the counting wheels do not receive the shock of a fast vehicle hitting the lever. The lever directly advances both a digit wheel and a 10-counting wheel, the digit wheel having a depression that allows a ratchet on the lever to engage the ten-counting wheel once in each revolution of the digit wheel.

3,667,673

WIND ACTUATED CONTROL DEVICE AND METHOD OF REGULATION THEREOF

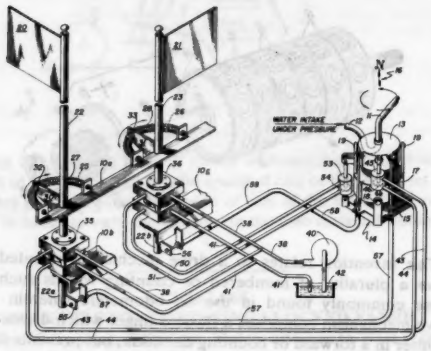
Vlademar Knudsen, 2443 Makiki Heights Drive, Honolulu, Hawaii

Filed Nov. 5, 1970, Ser. No. 87,073
Int. Cl. B05b *17/00*
U.S. Cl. 239—1 **6 Claims**

The invention comprises an assemblage of a wind-sensitive

device coupled to responsive power-operated means which in turn are connected to a given deice which requires movement or adjustment dictated by wind direction or wind velocity, or both.

In the example given, the invention, as shown in the



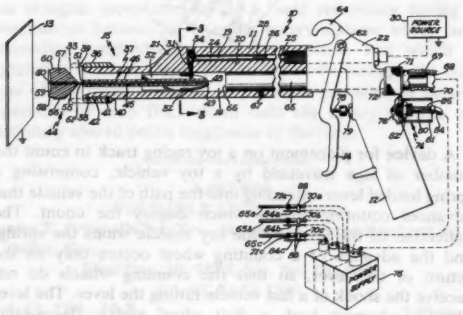
specification, is shown by way of illustration, as connected to and controlling the nozzle fit of a rotary irrigation sprinkler, with respect to the horizontal, and with respect to the wind-velocity and direction, in order automatically to achieve an optimum spray pattern.

3,667,674

ELECTROSTATIC POWDER COATING APPARATUS

Ronald F. Parsons, St. Paul, Minn.; Richard M. Sherman, Northville, Mich., and Robert M. Webb, Chicago, Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Feb. 16, 1971, Ser. No. 115,542
Int. Cl. B05b *5/00*
U.S. Cl. 239—15 **14 Claims**



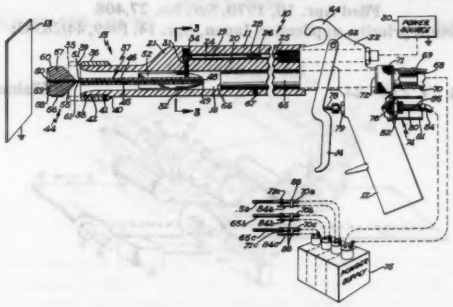
An electrostatic powder coating apparatus for coating the surfaces of articles with pulverulent materials having a quick and efficient material change feature such that said apparatus is adapted for selectively spraying materials having different characteristics wherein the change from one material to another can be accomplished without extensive purging of the system, said apparatus including a spray gun, a powder supply means adapted to be removably connected to the inlet of said spray gun, and a control means adapted to be connected to a switching means on said gun for controlling the supply of pulverulent materials to said gun.

3,667,675

ELECTROSTATIC POWDER COATING APPARATUS

Richard M. Sherman, Northville, Mich., and Robert M. Webb, Chicago, Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Feb. 16, 1971, Ser. No. 115,685
Int. Cl. B05b *5/00*
U.S. Cl. 239—15 **24 Claims**



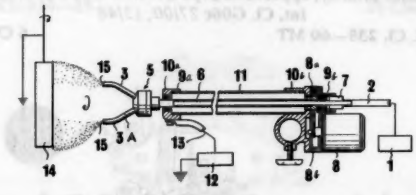
An electrostatic powder coating apparatus for coating the surfaces of articles with pulverulent materials having an ionization member which serves as both an improved charging means and a pattern forming deflecting means including a probe portion positioned immediately to the rear of a deflecting member and a probe portion extending past a forwardmost surface of the deflecting member, with said portions of the probe being maintained at an electrical potential substantially different than that of the article to be coated.

3,667,676

APPARATUS FOR ELECTROSTATICALLY COATING POWDERS ON A WORKPIECE

Tamotsu Watanabe, and Fumio Onoue, both of Tokyo, Japan, assignors to Nippon Kogei Kogyo Co., Ltd.

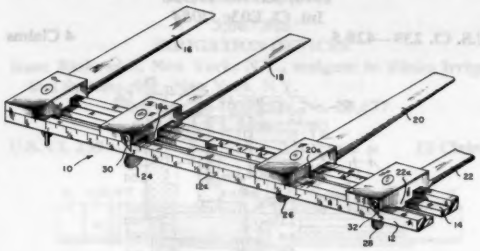
Filed Dec. 18, 1969, Ser. No. 886,170
Claims priority, application Japan, Mar. 26, 1969, 44/22366; June 11, 1969, 44/45364; 44/45365
Int. Cl. B05b *5/00*
U.S. Cl. 239—15 **5 Claims**



Apparatus for electrostatically coating powders on a workpiece from a rotating injection head having a plurality of nozzles disposed outwardly from the axis of the rotating injection head and rotatably mounted on the injection head for dispersing the powders. Each of the nozzles has a curved or bent portion, such that the distance between the nozzle and the axis of the rotating injection head and the angle from which the powders are dispersed are variable. The apparatus is utilized for performing a method of electrostatically coating powders on a workpiece comprising the steps of dispersing the powders in such a manner that the angle at which the powders are dispersed is variable. The apparatus also comprises a mixer connected to a source of compressed air for supplying the powders from a source through a pipe

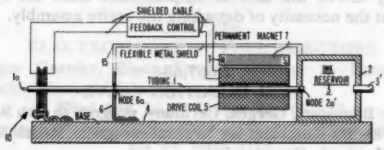
into the injection head with an air stream fed from a compressed air source, a controller for controlling the powder supply from the powder source to the injection head, and a constant powder supplying means for supplying the powders from the powder source to the mixer, whereby the powder supply is controlled by the powder supply means.

3,667,677
FABRIC PLEATER GUIDE
Edmund Jay Sprong, 38 Lockwood Lane, Riverside, Conn.
Filed Sept. 28, 1970, Ser. No. 76,062
Int. Cl. A41h *43/00*; D06j *1/00, 1/12*
U.S. Cl. 223—34 **5 Claims**



An adjustable fabric pleater guide which is portable and is provided with a scale on the measuring stick as well as indexes on the adjustable fabric guides for rapidly setting the required pleats longitudinally on the fabric.

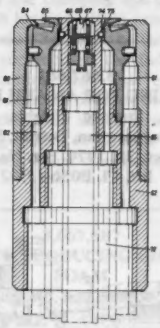
3,667,678
NOZZLE STRUCTURE FOR JET PRINTERS
John W. Haskell, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 13, 1970, Ser. No. 19,367
Int. Cl. B05b *3/14*
U.S. Cl. 239—102 **3 Claims**



An ink jet nozzle structure comprising a thin tube, connected to a pressurized ink reservoir, is encircled by an A. C. driven coil which induces longitudinal reciprocating motion to cause formation of ink droplets. A permanent magnet is in the proximity of the drive coil provides a biasing action. The tube length is chosen so as to permit it to vibrate resonantly at the frequency of the induced longitudinal reciprocating motion. Resonant vibration permits the tube to be supported at two points along its length greatly increasing its mechanical stability. An air damper located near the tip of the nozzle broadens the resonant response and provides differential signals proportional to the longitudinal movement of the tube to maintain movements at a fixed or preset level.

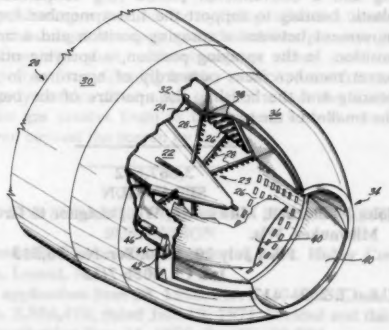
3,667,679
APPARATUS FOR MIXING A PLURALITY OF GASEOUS STREAMS
Josef Wiesenberger, Vienna, Austria, assignor to Dumag Ohg, Dr. Ludwig Kaluza & Co., Wien, Austria
Filed Dec. 22, 1969, Ser. No. 887,115
Claims priority, application Austria, Apr. 8, 1969, A 3379/69
Int. Cl. B05b *3/14*
U.S. Cl. 239—102 **3 Claims**

A method of mixing compressible fluid media (which may include an atomized spray) comprising delivering said media to a mixing zone, at least one said medium being a gas or vapor, and imparting to said gaseous or vaporous medium in



the mixing zone a supersonic velocity and/or a sonic vibration, whereby the supersonic velocity and/or the sonic vibration promotes mixing of the fluid media.

3,667,680
JET ENGINE EXHAUST NOZZLE SYSTEM
Willare N. Weed, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 24, 1970, Ser. No. 31,477
Int. Cl. B63h *25/46*; F02k *3/10*
U.S. Cl. 239—265.17 **24 Claims**



A variable area two-stage ejection nozzle exhaust system for a turbojet engine having an afterburner. wherein, a primary nozzle has spherical segments contained within a spherical shell housing which spherical segments are pivotally adjustable in response to augmented and non-augmented engine operation to provide for an efficient exhaust nozzle exit area choke plane; and a secondary nozzle with aerodynamically actuated trailing edge flaps for varying the secondary exhaust nozzle exit area in response to primary nozzle pressure variations and airplane Mach number. Also provided within the primary nozzle are separate clamshell type blocker doors which, in combination with fluid flow turning vanes incorporated into the primary nozzle wall, turn the fluid flow to obtain reverse thrust from the turbojet engine.

For engine sound suppression, an increase in the primary nozzle exit area at power settings below normal cruise power produces a sound suppression mode through the over expansion of the exhaust gases.

At higher engine power settings, one embodiment for sound suppression is accomplished by rotating channel

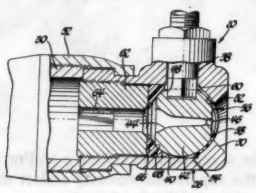
spokes into the exit gas flow and at the same time rotating internal clamshells to uncover openings to suppression tubes that are rotated outward into the free-stream airflow. The suppression tube exits are sized to equal the area of the flow blocked by the channel spokes to maintain engine/exhaust area match.

3,667,681

PLASTIC BEARING FOR AN AIRLESS SPRAY GUN

Erwin B. Biancha, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 21, 1970, Ser. No. 82,716
Int. Cl. B05b *15/02*
U.S. Cl. 239—393 **2 Claims**



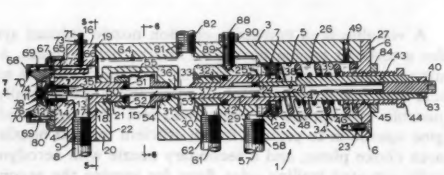
A plastic disc-like bearing for a turret member housing of an airless spray gun includes a roughened generally spherical outer surface that engages a generally spherical seat of the housing. An integral peripheral flange of the bearing has a roughened surface that engages a flange seat of the housing adjacent the periphery of the spherical seat. A smooth generally spherical inner surface of the bearing engages a generally spherical turret member received within the housing and a conventional plastic ring cooperates with the plastic bearing to support the turret member for rotational movement between a spraying position and a non-spraying position. In the spraying position, a spraying orifice of the turret member faces outwardly of apertures in the plastic bearing and the housing, the aperture of the bearing being the smaller of the two.

3,667,682

SPRAY GUN

John M. Purnell, Milwaukee, Wis., assignor to Grovhac, Inc., Milwaukee, Wis.

Filed July 20, 1970, Ser. No. 56,513
Int. Cl. B05b *7/12*
U.S. Cl. 239—412 **9 Claims**



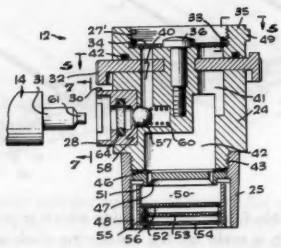
The disclosed gun for spraying atomized materials includes a housing having an orifice for discharge of the materials and atomizing air vent means associated with the orifice for atomizing the materials upon discharge from the orifice. A movable member and separate orifice closure member are reciprocally disposed in the housing and driven in sequence to provide for the venting of atomizing air through the vent means prior to the discharge of materials through the orifice. Adjustability is provided between the orifice containing member of the housing and the orifice closure member to compensate for wear therebetween, with such adjustability not materially affecting the flow volume of atomizing air. The main body and adjacent enclosure parts of the spray gun housing are secured together by a plurality of longitudinally extending fastening means to eliminate the need for distortion prone tools.

3,667,683

DIVERTER VALVE ASSEMBLY

Samuel Gilbert, Los Angeles, Calif., assignor to Hydro Manufacturing Inc., Encino, Calif.

Original application Mar. 16, 1967, Ser. No. 623,676, now Patent No. 3,500,824. Divided and this application Feb. 25, 1970, Ser. No. 17,995
Int. Cl. E03c *1/084*
U.S. Cl. 239—428.5 **4 Claims**



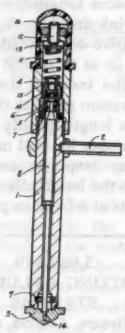
The invention described herein is an oral syringe which dispenses fluid under pressure for the purpose of cleaning teeth and massaging gums. A finger operated push button carried on the syringe handle allows the user to meter desired amounts of mouthwash from a container into the pressurized fluid stream through interconnecting valve passages and chambers. An aerator-valve assembly permits the syringe to be detachably coupled to an ordinary water faucet and additionally allows the user to by-pass fluid from the syringe without the necessity of detaching the entire assembly.

3,667,684

FUEL INJECTION VALVE

Walter Baumgart, Gergen, Germany, assignor to Veb Barkas-Werke, Ifa-Kombinat fur Kraftfahrzeugteile, Renak-Werke, Reichenbach, Germany

Filed Sept. 17, 1970, Ser. No. 72,955
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **10 Claims**



A fuel injection valve comprising a nozzle body having an inlet and an outlet and a cavity therebetween, a nozzle needle arranged in said cavity and spaced apart from said nozzle

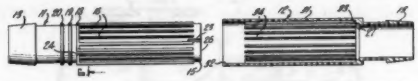
body to define an annular space therebetween for forming a fluid passage, said nozzle needle being mounted for reciprocating movement between opened and closed positions in said cavity, said nozzle body being sealed off at one end thereof by stop means, said nozzle needle at the end thereof adjacent said stop means being connected to a diaphragm arranged in said stop means, resilient guide means arranged in said nozzle body at the other end thereof from said stop means, said diaphragm and resilient guide means being mounted in said housing for securing said nozzle needle in a desired spatial relationship in said cavity whereby pressure applied onto said diaphragm acts to move said needle in said cavity between said open and closed position.

3,667,685

IRRIGATION DEVICES

Isaac Rinkewich, New York, N.Y., assignor to Rinko Irrigation Systems, Inc., New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,677
Int. Cl. B05b *15/00*
U.S. Cl. 239—542 **12 Claims**



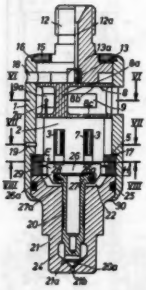
An irrigation device effecting drip action of water fed from a central tube by effecting a substantial pressure drop along the path of the water as it flows from the central feed tube to the exit of the device. The flow path of the water is labyrinthine so that the water path continuously reverses in order to create substantial turbulence to maintain in suspension the foreign matter to minimize the likelihood of clogging. The labyrinthine path causes the water to travel a considerable distance, thereby increasing the pressure drop so that the water drips at a slow rate.

3,667,686

ELECTROMAGNETIC FUEL INJECTORS

Georges Garnier, Blois, France, assignor to Roto-Diesel, Clichy (Hauts-de Seine), France

Filed Aug. 26, 1970, Ser. No. 67,133
Claims priority, application France, Sept. 15, 1969, 6931319
Int. Cl. B05b *1/30*
U.S. Cl. 239—585 **5 Claims**



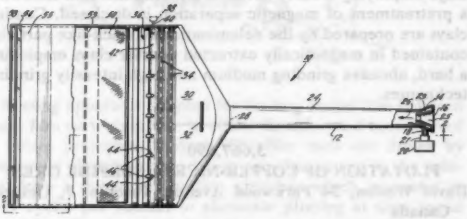
Electromagnetic fuel injector comprising a cylindrical body to which is attached an injection nozzle containing a sliding metering pintle in rigidly fixed relation to a movable armature or pallet which is attracted at each injection stroke of the cycle by an inductor formed of a magnetic core which carries a field winding and housed within the said injector body, wherein a stack of grain-oriented laminations which are cut out in the shape of m and form the inductor core is clamped at the end nearest the movable pallet within a hole formed through a holding disc of non-magnetic material which is stationarily secured within the injector body and at the opposite end by the clamping lips of two strips of non-magnetic metal each located within one of the two recesses which form a separation between the three magnetic arms of the said core and accomodate the field winding which is placed round the central arm, that end of the stack of laminations which is directed towards the movable pallet and that face of the holding disc which is also directed towards the said pallet being placed level with each other so as to form a reference plane which constitutes one side of the air-gap.

3,667,687

APPARATUS FOR PRODUCING HIGH EXPANSION FOAM

Leo E. Rivking, Springfield, and Adolph Blum, Scotch Plains, both of N.J., assignors to The Mearl Corporation, West Roselle Park, N.J.

Filed Aug. 10, 1970, Ser. No. 62,429
Int. Cl. B05b *1/14*; F23d *13/44*
U.S. Cl. 239—553.3 **8 Claims**



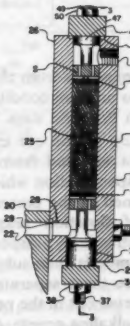
Foam producing apparatus comprising eduction means using compressed gas to sweep and educe lower pressure gas or gas laden with dust contaminants or other materials toward a porous foam forming barrier surface; foam forming solution spray nozzles direct such solution to wet the barrier surface; the gas creates foam at the screen, with the foam being moved beyond the screen by the gas.

3,667,688

METHOD FOR SHEARING SOLIDS IN A SOLIDS-LIQUID SUSPENSION

Joseph Iannicelli, Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Original application June 28, 1968, Ser. No. 740,955, now Patent No. 3,556,416, dated Jan. 19, 1971. Divided and this application Nov. 16, 1970, Ser. No. 89,973
Int. Cl. B02c *19/00*
U.S. Cl. 241—1 **4 Claims**



A method for dis-aggregating solid particles in a slurry by pumping the slurry at pressures in excess of 1,000 p. s. i.

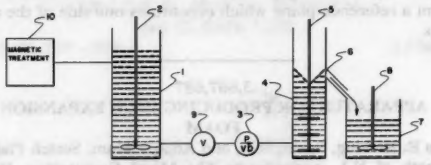
through a column containing particulate media clamped in a fixed position is disclosed.

3,667,689

METHOD FOR PRODUCING MINERAL PRODUCTS

James Brooks Whitley, and Joseph Iannicelli, both of Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Filed Dec. 15, 1969, Ser. No. 885,168
Int. Cl. B02c *21/00*
U.S. Cl. 241—15 4 Claims



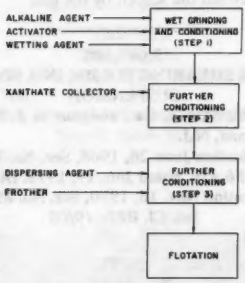
A method for producing minerals of reduced particle size and increased brightness, particularly high grade coating clays employing a hard, abrasive grinding medium following a pretreatment of magnetic separation is disclosed. Coating clays are prepared by the delamination of stack-like particles contained in magnetically extracted coarser clays employing a hard, abrasive grinding medium and high intensity grinding techniques.

3,667,690

FLOTATION OF COPPER-NICKEL SULFIDE ORES

David Weston, 34 Parkwood Avenue, Toronto, 7, Ontario, Canada

Continuation-in-part of application Ser. No. 727,268, May 7, 1968, now Patent No. 3,596,838. This application Nov. 3, 1969, Ser. No. 873,911. The portion of the term of the patent subsequent to Aug. 3, 1988, has been disclaimed.
Int. Cl. B03b *1/04*
U.S. Cl. 241—20 27 Claims



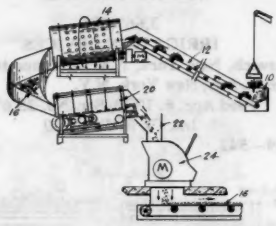
Flotation of sulphide minerals from their ores is achieved by a process in which two or more conditioning steps are carried out prior to a froth flotation step. The first step comprises conditioning a pulp of the ore in the presence of at least one alkaline agent selected from a group of agents which is defined in the specification which follows. The pulp is then further conditioned in the presence of a member of the xanthate family of flotation reagents and sufficient dispersing agent to effectively disperse the host rock minerals. The resulting pulp is then subjected to froth flotation. Preferably there are three separate conditioning steps, namely conditioning carried out in the presence of (1) one of the hereinafter defined alkaline agents, (2) a member of the xanthate family of flotation reagents, and (3) sodium silicate. The invention is particularly valuable for the recovery of metallic sulphides from ores containing talcy minerals or natural slimes and the invention has been applied with signal success to the flotation of copper-nickel sulphide ores containing over 40 percent weight of talcose host rock minerals.

3,667,691

METHOD FOR CRUSHING METAL TURNINGS

A. George Goldberg, Montreal, Quebec, Canada, assignor to I. I. Selig & Sons Ltd., Ville La Salle, Quebec, Canada

Filed July 22, 1970, Ser. No. 57,049
Int. Cl. B02c *21/00*
U.S. Cl. 241—24 2 Claims



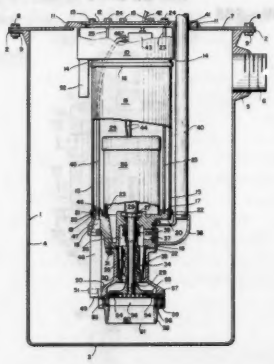
In the crushing of metal turnings, the turnings are first passed through a centrifugal separating drum where the fines and solid chunks are separated from the clusters of turnings. The chunks are removed, and the clusters of turnings are then passed to a shredding apparatus, which includes an endless chain conveyor, mounting teeth for advancing the clusters of metal turnings towards the crusher or pulverizer and stationary teeth spaced above the conveyor and cooperating with the teeth on the conveyor for shredding the large clusters of metal turnings as they are advanced towards the crusher or pulverizer.

3,667,692

PUMP STORAGE GRINDER

Richard C. Grace, Carlisle, N.Y., assignor to Environment/One Corporation, Latham, N.Y.

Filed Apr. 9, 1970, Ser. No. 26,925
Int. Cl. B02c *13/18*
U.S. Cl. 241—36 27 Claims



The pump storage grinder employs a tank having a sewage inlet and a removable top cover supporting a depending sealed housing having a motor and motor controls for driving a grinder or comminutor and pump externally of the chamber by means of a common motor shaft. The chamber is formed by a control housing integral with the cover, a tube and pump head, all held together by means of tension bolts

secured between the pump head and cover. The motor shaft extends through the pump head to drive a resilient helical pump and a comminutor impeller disc with depending blades that cooperate with a comminutor ring held between a comminutor inlet shroud and a pump housing secured to the pump head. A pump discharge chamber is provided in the head with a one-way valved passage leading to a discharge conduit extending through the cover. The level responsive motor control is provided with a liquid pressure sensing tube extending through the chamber in communication with a depending pipe secured to the pump head and housing.

3,667,693

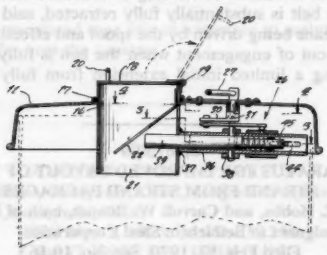
REFUSE CAN BOTTLE CRUSHER

Kathleen E. Leeds, P.O. Box 201, New Port Ritchery, Fla., and James E. Davis, 6758 Chestnut St., Cincinnati, Ohio

Filed Oct. 31, 1969, Ser. No. 873,000

Int. Cl. B02c *19/14*

U.S. Cl. 241—99 **1 Claim**



A garbage can incorporating a lid having a bottle crusher built thereinto, the bottle crusher incorporating a receptacle into which a bottle is receivable and held by a bottle holder after which a plunger drives ram against the bottle to crush the same, the broken bottle droping into the garbage can.

3,667,694

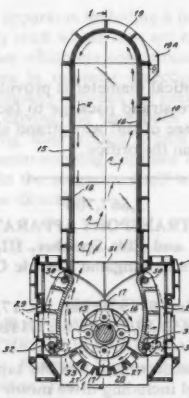
MATERIAL REDUCING HAMMER MILL

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher & Pulverizer Co., Inc., St. Louis, Mo.

Filed July 17, 1970, Ser. No. 55,728

Int. Cl. B02c *13/02*

U.S. Cl. 241—186 R **9 Claims**



A material reducing hammer mill of reversible character having a material feed stack and breaker bars arranged to control the trajectory of the material being reduced such that the material flung reversely in the feed stack may be directed in its flight to reduce the damaging wear on the walls of the feed stack. The control is obtained by utilizing the breaker bars on the off-side relative to rotation of the hammer rotor to direct the trajectory of the flying material in a predetermined path in the feed stack to minimize the impact and wear on the walls of the feed stack.

3,667,695

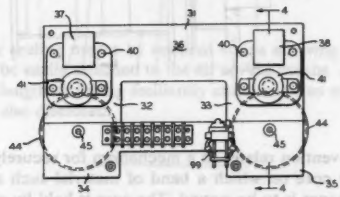
REELING APPARATUS WITH DYNAMIC VIBRATION ABSORBER

Philip J. Brownscombe, Millington, N.J., assignor to Eugene Dietzgen Co., Chicago, Ill.

Filed Feb. 16, 1970, Ser. No. 11,471

Int. Cl. B65h *75/02*; G03b *1/04*; B65h *75/34*

U.S. Cl. 242—55 **12 Claims**



Reeling apparatus adapted for feeding reeled film between reels, film cartridges, etc. in either direction and uses thereof in image projection devices. The film reels are driven by respective electric motor-driven spindles having in the spindle drive a dynamic vibration absorber which resonates at sixty cycles per second to eliminate jittering at slow speed film drive of an image projected on a screen.

3,667,696

CORE GRIPPING AND RELEASE DEVICE

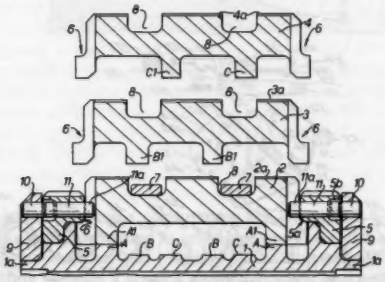
Reginald J. McCarthy, London, England, assignor to Frank F. Pershke Limited, Surrey, England

Filed Apr. 22, 1970, Ser. No. 30,918

Claims priority, application Great Britain, Apr. 24, 1969, 20,999/69

Int. Cl. B65h *75/24*

U.S. Cl. 242—72 **3 Claims**



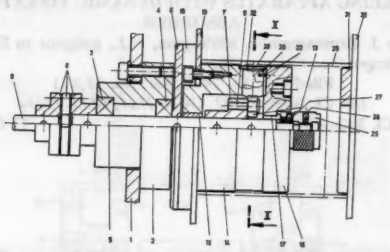
An expandible and contractable device for mounting on a driven shaft of a paper or like handling machine for drivingly engaging the core of a reel of paper and comprising a one-piece cylindrical body part for fixing to said shaft and formed externally with eccentrics, and an outer cylindrical part consisting of trough-like parts having internal eccentrics which combine with those of the body part.

3,667,697

MECHANISM FOR HOLDING A TUBULAR CORE

Erich Binder, Regensdorf/Zurich, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 16, 1969, Ser. No. 885,491
Claims priority, application Switzerland, Dec. 17, 1968, 18733/68
Int. Cl. B65h *75/24*
U.S. Cl. 242—72 6 Claims



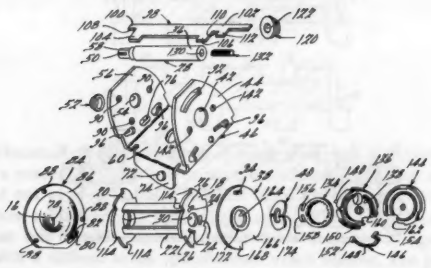
This invention relates to a mechanism for securely holding a tubular core on which a band of material such as photographic paper is to be wound. The core is held by a gripping mechanism inside a mandrel on which the core is mounted. Running through the mandrel coaxially therewith is a rotatable shaft having three rollers each mounted on a different apex of a triangular plate securely coupled to the shaft. Studs radially located within the mandrel are positioned to be engaged by the rollers so that on rotation of the shaft relative to the mandrel the studs protrude through the periphery of the mandrel to grip the core. A friction clutch between the mandrel and the shaft is provided to hold them in position after the studs have been engaged with the core.

3,667,698

LOCKING SEAT BELT RETRACTOR

Robert C. Fisher, 580 E. Longlake Rd., Bloomfield Hills, Mich.

Continuation of application Ser. No. 759,064, Sept. 11, 1968, now abandoned , and a continuation-in-part of 629,689, Apr. 10, 1967, now abandoned. This application Jan. 22, 1971, Ser. No. 108,923
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 28 Claims



This invention relates to an automatic locking seat belt retractor of the type in which the belt is wound on a spring actuated spool which exerts a constant belt retracting force on the belt while allowing the belt to be extended by manually pulling it off the spool, and in which means are provided for locking the belt against further extension at any desired degree of extension by locking the spool against unwinding rotation, which means operates in response to a limited retracting movement of the spool. The invention resides in an improved and simplified means for effecting such locking action consisting of a pawl and ratchet normally biased to an engaged position in which they prevent unwinding rotation of the spool and a member journaled concentrically with the spool for limited rotation and having a frictional driving connection with the spool. The said member is frictionally driven to one limit of its movement by a limited extension of the belt and in that position holds the pawl out of engagement during further extension. Initial retracting movement at any degree of extension moves the member to a position in which it allows pawl engagement; thereby locking the belt against further extension. The member is preferably so constructed that further retracting movement of the belt moves the member beyond the last mentioned position to a position in which it again holds the pawl out of engagement with the ratchet to minimize noise and wear during retraction.

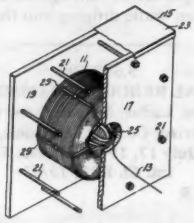
The invention further contemplates means for unlocking the retractor manually and also an improved means for unlocking the retractor or holding it unlocked automatically when the belt is substantially fully retracted, said last mentioned means being driven by the spool and effective to hold the pawl out of engagement when the belt is fully retracted and during a limited initial extension from fully retracted position.

3,667,699

APPARATUS FOR IMPROVED PAYOUT OF WIRE STRAND FROM STRAND PACKAGES

Marcus E. Hobbs, and Carroll W. Bonnet, both of Baltimore, Md., assignors to Bethlehem Steel Corporation

Filed Feb. 10, 1970, Ser. No. 10,163
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 16 Claims



An orifice of a critical diameter is provided in or adjacent to one side of a wire strand package to facilitate controlled payout from a package of stiff wire strand about a temporary core positioned within the orifice.

3,667,700

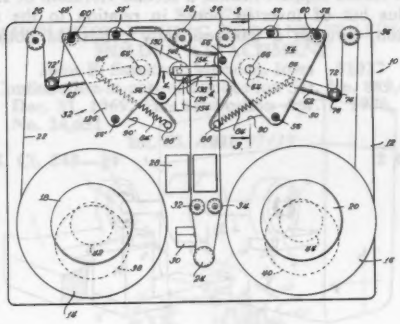
TAPE TRANSPORT APPARATUS

Murray C. Carney, and Ellis Speicher, III, both of Springfield, Ill., assignors to Sangamo Electric Company, Springfield, Ill.

Filed Mar. 9, 1970, Ser. No. 17,847
Int. Cl. B65h *59/38, 63/02;* G11b *15/32*
U.S. Cl. 242—189 16 Claims

Apparatus for transferring a flexible tape from a supply reel to a take-up reel including drive motor and brake means for each of the tape reels, a capstan disposed between the reels for effecting selective transfer of the tape between the reels, and a pair of tape storage devices each disposed between one of the tape reels and the capstan, each storage device being adapted to accommodate variations in tape

length between the associated tape reel and the capstan and having switch contacts operable to control rotation and braking of the associated tape reel in a manner to maintain linear tape transfer over the capstan.



3,667,701

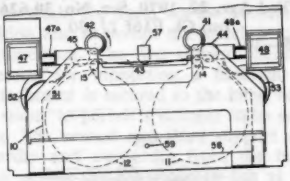
MAGNETIC TAPE APPARATUS

James E. Blum, Sunnyvale, Calif., assignor to Cybercom Corporation, Sunnyvale, Calif.

Filed May 7, 1970, Ser. No. 35,356

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—192 **1 Claim**



Magnetic tape apparatus including a tape magazine having takeup and supply reels whose rims are engaged by constant-torque slip clutches which are concurrently engaged with the reels driving them in opposite directions to maintain the length of tape extending between the reels in a tension condition. Means for driving the tape back and forth include a shuttle bar having idler rollers which move alternatively between two counter-rotating capstans to engage two guide rollers mounted in the magazine itself to move the tape in a forward or reverse direction.

3,667,702

METHOD AND APPARATUS FOR TRANSPORTING CONTAINERS THROUGH A PNEUMATIC TUBE SYSTEM

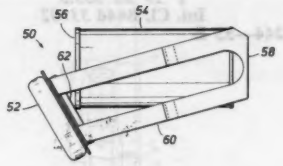
William E. Kelley, Houston, Tex., assignor to C. K. Kelley & Sons, Inc., Houston, Tex.

Filed Mar. 19, 1970, Ser. No. 21,143

Int. Cl. B65g *51/06*

U.S. Cl. 243—32 **7 Claims**

A method of transporting containers through a pneumatic tube system by detachably securing the containers directly to air sealing means prior to insertion in the system. A carrier specifically designed for containers uses the container as the body. The container is held in position by a harness attached to the air sealing means by resilient straps allowing the container to be easily attached to the air sealing means. A carrier having a length of tubing resiliently attached to an air sealing means is also disclosed.



3,667,703

AUXILIARY AIR INTAKE FOR AIR AND SPACECRAFT ENGINES

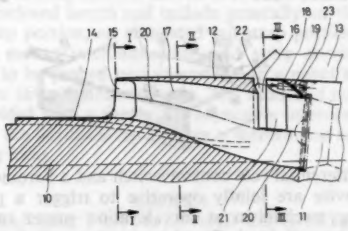
Helmut Boek, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Jan. 26, 1970, Ser. No. 5,520

Claims priority, application Germany, Feb. 7, 1969, P 19 06 157.5

Int. Cl. B64d *27/00*, *29/00*

U.S. Cl. 244—53 B **16 Claims**



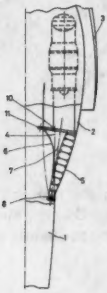
Auxiliary air intake construction for jet engines having a main air intake enclosed in an engine cowling and leading to the engine air inlet. The auxiliary air intake consists of a slot extending through a portion of such cowling and defined by walls which form an acute angle with the axis of the main air intake. A recess is formed in one of said walls and a door structure for at least one sliding door is arranged within said recess. Said door structure includes operating means for retracting same within said recess to open said auxiliary air intake and for extending same across said slot to close same. Said door structure is so positioned and arranged that when in extended position its outer surface is substantially flush with the surface of the engine cowling and its inner surface is substantially flush with the wall defining the main air intake.

3,667,704

CLOSABLE AIR INTAKE DUCT MOUNTED ON THE FUSELAGE AND OPEN IN THE DIRECTION OF FLIGHT

Karl H. Assmann, Germering, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed May 5, 1970, Ser. No. 34,693
Claims priority, appplication Germany, May 23, 1969, P 19 26 553.3
Int. Cl. B64d *33/02*
U.S. Cl. 244—53 B 5 Claims



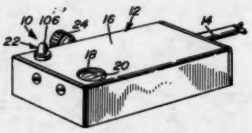
Door for the air intake duct of auxiliary engine of jet aircraft. The door is pivotally mounted at the forward end of the recess in the fuselage which recess is normally provided and aligned with the air intake duct for the auxiliary engine. In open position the door surfaces are aligned with the surfaces of the auxiliary air intake duct while in closed position the door provides a surface aligned with the inner surface of the main air intake duct.

3,667,705

AUTOMATIC CONTROL SYSTEM FOR PARACHUTES

Stephen L. Snyder, 331 Cherry Hill Blvd., Cherry Hill, N.J. 08034

Filed Jan. 12, 1970, Ser. No. 2,332
Int. Cl. B64d *17/58*
U.S. Cl. 244—150 25 Claims



A differential rate control switch and a barometric control device are jointly operative to trigger a parachute opening mechanism at an elevation preset relative to acutal ground level. The barometric control device determines the altitude at which the parachute is opened if the chutist is falling at a high enough velocity as determined by the rate control switch. The system is readily adjusted for the current barometric pressure at the desired ground level elevation immediately prior to use.

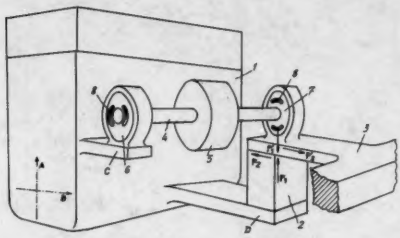
3,667,706

ANTIVIBRATORY DEVICES WITH PHASE REVERSAL

Pierre Tiberghien, Billancourt, France, assignor to Regie Nationale des Usines Renault & Automobiles Peugeot, Billancourt, Hauts-de-Seine, and Paris, France

Filed June 22, 1970, Ser. No. 48,175
Claims priority, application France, July 25, 1969, 6925512
Int. Cl. F16f *15/00*
U.S. Cl. 248—9 6 Claims

Device for damping out a vibration generated by an engine and transmitted directly to the frame structure or chassis through elastic support means connecting the engine to said frame structure or chassis, applicable notably to motor vehicles and machine tools, and adapted to introduce into the frame structure, as near as possible to said elastic support means, a second vibration of same modulus but of inverted phase in relation to the first vibration, through a bar resiliently connected both to the engine and to said frame structure and adapted to carry throughout its length an inertia weight displaceable therealong for adjustment purpose, characterized in that the terminal elastic elements connecting said bar to said engine and to said frame structure have anisotropic elastic properties depending on the stiffness values of the elements along two orthogonal axes substantially perpendicular to the bar axis.

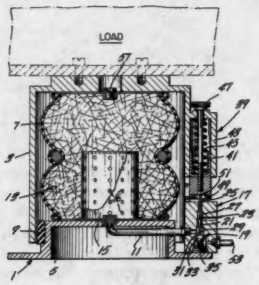


3,667,707

AIR SUPPORT

Billy Y. K. Mui, Astoria, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

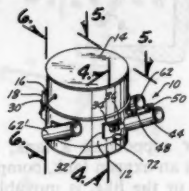
Filed Apr. 22, 1970, Ser. No. 30,626
Int. Cl. F16f *11/00*
U.S. Cl. 248—20 16 Claims



An air support for maintaining a load at a preselected height while isolating the load with respect to vibrations. The support includes a housing which is disposed above and in slidable engagement with a base. Support for the housing is provided by an inflatable bag to which compressed air is supplied through an air admission valve. When the housing moves downward from the preselected height, a rod forces the check valve open admitting additional air to the bag. The rod carries a piston journalled in a passageway whereby air is continuously allowed to escape from the system. If the housing moves above the preselected height by more than a predetermined distance the rod also moves upward allowing additional air

to escape from the bag to provide a fast return to the preselected height without or with a minimum of oscillation.

3,667,708
COMBINATION FISHING ROD AND FLASHLIGHT HOLDER ATTACHMENT
John F. Smeltzer, Meriden, Iowa 51037
Continuation-in-part of application Ser. No. 889,484, Dec. 31, 1969. This application Apr. 1, 1970, Ser. No. 24,651
Int. Cl. A01k *97/10*
U.S. Cl. 248—39 **2 Claims**



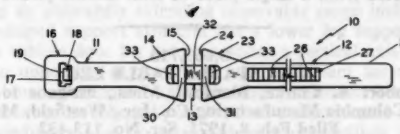
A combination fishing rod and flashlight holder attachment for use with a cylindrical container comprising a flexible band adapted to be extended around the container and secured thereto. A first tubular support member is selectively movably secured to the band and is adapted to receive one end of a fishing rod therein to support the same. Second and third tubular support members are adjustably movably secured to the band on opposite sides of the first support member and are adapted to receive either a flashlight or a fishing rod therein to support the same. The attachment includes tightening means to maintain the band on the container in the selected position and to permit the attachment to be easily removed therefrom. The first support member also has means thereon for supporting a flashlight thereon. A stringer attachment is secured to the band below the first support member to permit a stringer to be secured to the attachment. The second and third support members extend upwardly and outwardly from the band and are designed to permit the fisherman to fish at night with a flashlight being placed in one of the tubular support members so as to direct light on the upper end of the fishing rod in the first support member. The second and third support members are spaced approximately 180 degrees apart with respect to the container to permit the fisherman to selectively use either of the same depending upon the direction of the stream flow. The first support member also has means thereon for supporting a flashlight thereon.

3,667,709
LENGTHWISE ADJUSTABLE SUSPENSION DEVICE FOR ARTICLES, PARTICULARLY SANITATION AND HEATING PIPES
Rudolf Linser, Renningen, Germany, assignor to Stanzwerke Glarus AG, Buchholz, Switzerland
Filed Sept. 25, 1970, Ser. No. 75,323
Int. Cl. F16l *3/14*
U.S. Cl. 248—59 **4 Claims**

A lengthwise adjustable suspension device for articles, such as in particular sanitation or plumbing pipes and heating conduits, which is of the type incorporating a suspension band member provided at one end thereof with an attachment element to which there can be secured the article which is to be suspended. The invention contemplates the provision of mechanism for regulating the suspension length of the article supported by the band member, such mechanism embodying a rotatably mounted

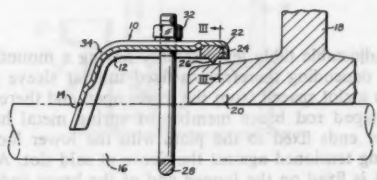
element onto which there can be wound-up and wound-off one end of the band member.

3,667,710
FLEXIBLE STRAP FASTENER
Roy A. Moody, Flossmoor, and Jack E. Caveney, Chicago, Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed Aug. 26, 1970, Ser. No. 67,117
Int. Cl. F16l *3/14*
U.S. Cl. 248—71 **16 Claims**



A flexible strap fastener and several embodiments thereof are disclosed herein and include generally an elongated head strap portion, an elongated tail strap portion, and a resilient mount interconnecting said strap portions and adapted to be pushed into an opening in a panel to retain the entire strap fastener thereto. The head and tail straps are provided with a means for adjustable interconnection whereby the flexible strap fastener is formed into an article retaining loop.

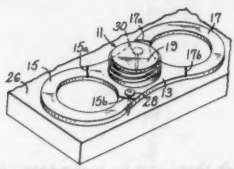
3,667,711
HANGER FOR PIPES AND CONDUITS
Martin S. Kissel, 806 Main St., Latrobe, Pa. 15650
Filed Oct. 13, 1970, Ser. No. 80,273
Int. Cl. F16l *3/04*
U.S. Cl. 248—72 **9 Claims**



The specification discloses a hanger for supporting a pipe or conduit or the like on a flange, such as the flange of a beam. The hanger is in the form of an L shaped member adapted to engage the upper side of the flange

at one end of one of the legs and to engage the top of the pipe or the like with the end of the other of the legs. A U bolt embracing the pipe or the like from beneath has leg portions extending through the ranger and receiving nuts to clamp the assembly fixedly in place.

3,667,712
NOZZLE STORAGE UNIT
George Michael Furgueson, Dogwood Drive, Centerbrook, Conn. 06409
Filed July 10, 1970, Ser. No. 53,864
Int. Cl. A47f *5/08, 7/00*
U.S. Cl. 248—75 **6 Claims**

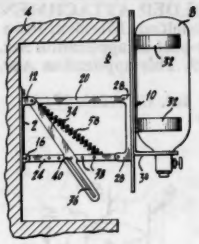


A device for storing a hose nozzle comprising a support member, an externally threaded bracket member on the support member for threadably receiving a hose nozzle, and a pair of apertured members resiliently connected to the support member and adapted to receive and hold a hose through the apertures. The support member, bracket member, and apertured members preferably are constructed from a single piece of semi-flexible plastic.

3,667,713
ADJUSTABLE TABLE LEG
Robert A. Clarke, Blanford, Mass., assignor to The Columbia Manufacturing Co., Inc., Westfield, Mass.
Filed Feb. 8, 1971, Ser. No. 113,432
Int. Cl. F16m *11/26*
U.S. Cl. 248—188.5 **2 Claims**

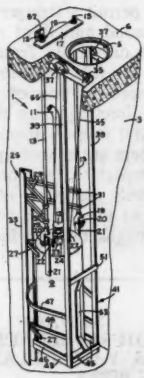
Adjustable table leg assembly having a mounting plate and depending therefrom a fixed tubular sleeve provided with a slot spaced from the lower open end thereof and a V-shaped rod brace member of spring metal having its outer ends fixed to the plate with the lower looped end spring tensioned against the sleeve at said slot. A tapered stud is fixed on the looped end of the brace and projects through said slot. An adjustable tubular lower leg section is slidably inserted in the sleeve and has a series of longitudinally spaced holes releasably engageable by the tapered stud to secure said leg section by the brace member at a selected position of telescopic extension.

3,667,714
TANK SUPPORT
Theodore Ziaylek, Jr., P.O. Box 292, Yardley, Pa. 19068
Filed Aug. 14, 1970, Ser. No. 63,822
Int. Cl. A47f *5/00*
U.S. Cl. 248—284 **5 Claims**



A bracket for supporting a tank, cylinder, or other container such as an oxygen tank, compressed air cylinder, fire extinguisher or the like, is movable to a retracted or inactive position wherein the tank may be housed within a cabinet or recess in a wall, fire apparatus or the like and is movable to an extended or operative position permitting easy removal of the tank for use. Means are further provided for releasably holding the bracket and tank in either of its alternative positions.

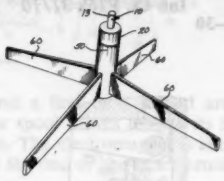
3,667,715
MOUNTING APPARATUS FOR REMOTE DISENGAGEMENT AND ENGAGEMENT OF SUBMERSIBLE PUMPS
Johann Mertens, Santa Cruz, Calif., assignor to Nuclear Waste Systems Company, Campbell, Calif.
Filed Jan. 25, 1971, Ser. No. 109,182
Int. Cl. B67d *5/64;* **F04d** *13/08*
U.S. Cl. 248—327 **10 Claims**



Mounting apparatus for lowering, raising and securing in place a submersible pump. The apparatus includes an alignment rack for aligning within a liquid holding vat a submersible pump with a discharge pipe within the vat for coupling to the pump. Adjustable members are adapted for engaging the pump within the vat and extending outside the vat. The members are further adapted to urge the pump in and out of coupling relationship to the discharge pipe responsive to adjustments performed on said

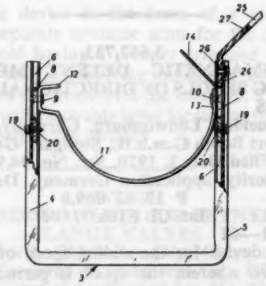
members outside the vat. A pump cage is guided relative to the alignment rack and discharge pipe. The cage is movable laterally with relationship to the discharge pipe so as to move the pump laterally clear of the discharge tube when the pump and pipe are uncoupled, and pulley means are provided for raising and lowering the pump from and to the cage when clear of the discharge tube.

3,667,716
TELESCOPING CHAIR BASE
Bernard J. Fries, Jenison, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Aug. 31, 1970, Ser. No. 68,178
Int. Cl. F16m *11/00, 13/00*
U.S. Cl. 248—405 **11 Claims**



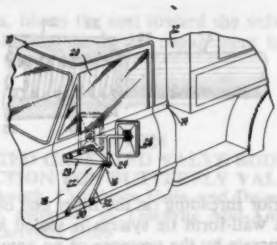
A threaded chair spindle is threadably carried by a nut which is rotatably supported by a hub tube such that the lower bearing surface of the spindle extends within the hub tube. A spindle cover tube is longitudinally fixed with respect to said spindle and encloses the threaded portion of the spindle but can be rotated with respect to the spindle. An elongated, vertical rib projects inwardly from the inside surface of the spindle cover tube and mates with a vertical groove in the side of the nut so that the spindle and the spindle cover tube can be raised or lowered by rotating the spindle cover tube with respect to the spindle.

3,667,717
DEVICE FOR RAINWATER PIPES IN BUILDINGS PROVIDED WITH CORNICES
Kenneth Ulf Folke Fasth, Halmstad, Sweden, assignor to AB C. W. Erikssons Platslageri Eftr. Halmstad, Sweden
Filed July 22, 1970, Ser. No. 57,052
Claims priority, application Sweden, July 24, 1969, 10,416/69
Int. Cl. E02b *9/04*; E04d *13/00*
U.S. Cl. 248—48.2 **6 Claims**



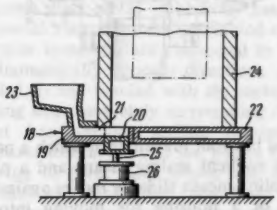
A gutter assembly intended for use in buildings provided with roof cornices of the kind carried in generally U-shaped mounting members. The roof gutter is mounted in said cornices such that the correct fall of a gutter length is easily obtainable and the inclination given to it remains even under considerable load. To obtain this, the mounting members are provided with stirrups carrying the gutter lengths proper, the said stirrups being slidingly mounted in the upright limbs of the mounting members by means of slides which may be adjusted to desired inclination by means of an arrangement of holes and a locking means.

3,667,718
ADJUSTABLE REAR VIEW MIRROR ASSEMBLY
Gerald E. Goslin, Mount Clemens, Russell R. Hershberger, Birmingham, and George J. Mach, Berkley, Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation of abandoned application Ser. No. 770,522, Oct. 25, 1968. This application May 18, 1971, Ser. No. 144,595
Int. Cl. B60r *1/06*
U.S. Cl. 248—487 **7 Claims**



A rear view mirror assembly for use on motor vehicles having an outwardly extending removable cargo includes an L-shaped support arm that has a lower leg supported at the vehicle door for rotation about a vertical axis and has an upper leg supporting a mirror element for rotation about a horizontal axis. The mirror element is movable between an inboard position used under normal driving conditions and an outboard viewing position used when a cargo is being carried by rotation of the support member about the vertical axis coupled with rotation of the mirror element about the horizontal axis.

3,667,719
ARRANGEMENT FOR THE BOTTOM POURING OF SLAG INTO A CHILL MOULD
Vitaly Mikhailovich Baglai, Ulitsa Semashko 10, kv. 54/3; Jury Vadimovich Latash, Vozdukhoflotsky prospekt 48, kv. 14; and Boris Izrailevich Medovar, Bulvar Lesi Ukrainki 2, kv. 8, all of Kiev, U.S.S.R.
Filed Nov. 18, 1969, Ser. No. 877,663
Int. Cl. B22d *27/02*
U.S. Cl. 249—109 **3 Claims**



An arrangement for the bottom pouring of slag into a chill mould of an electroslag furnace, comprising a head piece for allowing the liquid slag to be poured, and a member provided with a duct connecting the cavity of the headpiece with the cavity of a chill mould, the member with

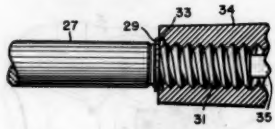
duct being mounted so as to be capable of moving in relation to the chill mould in order to overlap this duct at the point where it communicates with the cavity of the chill mould after the liquid slag has been poured thereinto, and wherein the pouring of the slag into the chill mould enables ingots to be obtained without any lateral projections in their bottom end, and allows effecting the accurate dosing of slag being poured into the chill mould.

3,667,720

TIE ROD CONFIGURATION FOR SEALING THE THREADED INNER END OF A SHEBOLT

Chester I. Williams, 347 Greenbriar SE., Grand Rapids, Mich. 49506

Filed Sept. 22, 1969, Ser. No. 859,757
Int. Cl. E04g 17/06, 17/08
U.S. Cl. 249—213 4 Claims



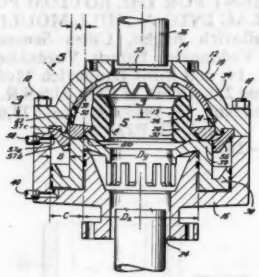
The interior threading on the inner end of a shebolt installed in a wall-form tie system is sealed against the ingress of concrete by the presence of an annular ring adjacent the inner extremity of the threading at the ends of the inner tie rod. The sealing ring is deformable, and operates preferably in conjunction with a positive stop arrangement engageable with the end of the tie rod.

3,667,721

BLOWOUT PREVENTER

Ado N. Vujasinovic, Fullerton, Calif., assignor to The Rucker Company, Oakland, Calif.

Filed Apr. 13, 1970, Ser. No. 27,947
Int. Cl. E21b 33/06
U.S. Cl. 251—1 8 Claims



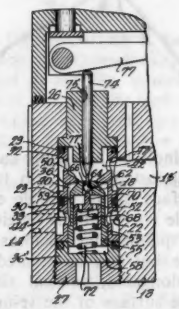
An improved blowout preventer in which a packing element having a resilient sealing means and a plurality of metallic translating means slidably moves against a curved inner surface of a housing for moving into a sealed position in which the packing element is positioned against but not connected to an actuating piston for increased sealing performance, freedom of movement, and for ease of replacement and in which the axial extent of the curved portion of the translating means is less than the curved outer surface of the packing element whereby the sealing means may circumferentially contact the curved inner surface of the housing to form a seal to provide an improved closing characteristic, and the bases of the translating means are further away from the bore whereby the sealing means on the bottom of the packing element is only slightly compressed allowing a fast response and quick adjustment of the packing element to changes in diameter and configuration of moved-through components of the drilling string.

3,667,722

PROPORTIONAL VALVE

Sherwin D. Katz, Skokie, and Joseph M. Levon, Arlington Heights, Ill., assignors to I-T-E Imperial Corporation

Filed Oct. 22, 1970, Ser. No. 83,062
Int. Cl. F16k 31/10
U.S. Cl. 251—30 10 Claims



A proportional variable flow control valve including a piston type main valve member having a pilot valve slidable axially therein that controls the pressure drop across the main valve and hence the opening of the main valve. The piston type main valve forms a chamber in the main valve housing that is continuously pressurized by inlet fluid thereby tending to close the valve, and the ball valve is positioned to relieve pressure in this chamber to permit opening of the valve under a constant inlet fluid biasing force acting on the valve. An actuator is provided for the ball pilot valve that shifts the ball valve in an amount proportional to the desired flow rate through the main valve and in response to the differential pressures the main valve opens a corresponding amount.

3,667,723

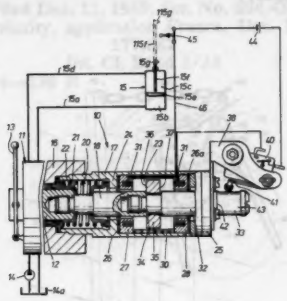
ELECTROMAGNETIC DETENT MEANS FOR SLIDING SPOOLS OF DIRECTIONAL CONTROL VALVES

Klaus Schneider, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 3, 1970, Ser. No. 94,913
Claims priority, application Germany, Dec. 11, 1969, P 19 62 069.0
Int. Cl. F16k 31/44
U.S. Cl. 251—68 17 Claims

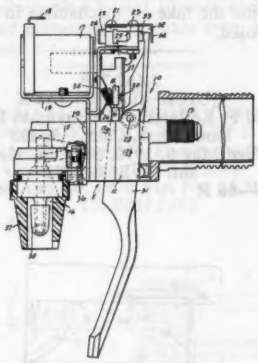
A detent device for the sliding spool of a directional control valve wherein the spool is permanently biased to a neutral position and is movable to two operative positions. The detent device has an armature which is mounted on the spool and is movable toward a first or a second electromagnet in the valve housing in response to movement of the spool to the one or the other operative position. The electromagnets are automatically energized shortly before the spool reaches an operative position, and

at least one electromagnet can be deenergized with a fixed or variable delay following energization to permit a resetting spring to return the spool to its neutral position. Alternatively, the spool can carry an electromagnet which



is movable against a first or a second armature in the housing when the spool moves toward its first or second operative position. The electromagnet is energized shortly before it reaches the one or the other armature.

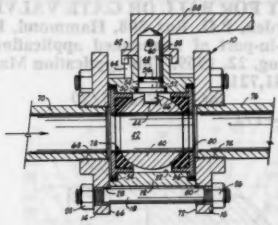
3,667,724
SOLENOID ACTUATED DISPENSING VALVE
Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed June 10, 1970, Ser. No. 44,925
Int. Cl. F16k *31/05*
U.S. Cl. 251—138 **5 Claims**



A dispensing device in the form of a mixing valve assembly has separate actuator arms for the fluids to be mixed, a solenoid having a plunger arranged to rock the actuator arms, and a selectively actuatable switch on the device connected in circuit with the solenoid. There is also included a manually movable lever located at the discharge nozzle for actuating the switch.

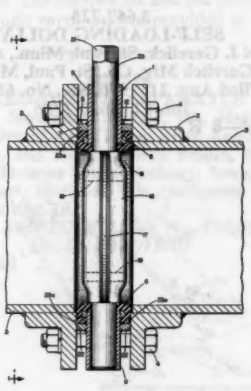
3,667,725
UNSTRESSED SEATS FOR BETWEEN FLANGE VALVES
Domer Scaramucci, Oklahoma City, Okla., assignor to Balon Corporation, Oklahoma City, Okla.
Continuation-in-part of application Ser. No. 526,936, Jan. 3, 1966, now Patent No. 3,428,292. This appplication Aug. 7, 1968, Ser. No. 750,873
Int. Cl. F16k *5/06*
U.S. Cl. 251—151 **7 Claims**

An improved valve wherein a sealing ring is disposed in a counterbore in the valve body and maintains sealing engagement between the connecting means which holds the valve in assembled relationship, and the valve body. The sealing ring is also in engagement with a valve seat, such that the sealing ring, deformed by the con-



necting means, biases the seat toward the valve member, thereby establishing the initial engagement between the seat and the valve member.

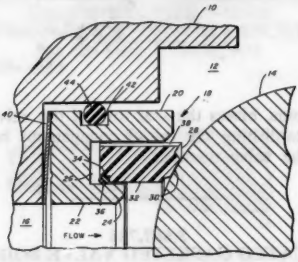
3,667,726
FABRICATED GASKETED VALVE BODY CONSTRUCTION FOR BUTTERFLY VALVES
Herman S. Church, Cuyahoga Falls, and Duane J. Clark, Kent, Ohio, assignors to Teledyne Mid-America Corporation, Hartville, Ohio
Filed Jan. 4, 1971, Ser. No. 103,505
Int. Cl. F16k *1/22*
U.S. Cl. 251—151 **10 Claims**



A fabricated plate metal valve body has spaced inner and outer metal ring members assembled concentrically. Valve operator trunnions are connected to the rings and extend in diametrically opposite directions. A rubber gasket is molded to and bonded with the metal rings within the outer ring and completely surrounding the inner ring. The gasket has annular sealing portions projecting axially in cross section beyond the planes of the ends of the outer ring to form seals engageable with the ends of pipe flanges with which the valve body is assembled. A butterfly valve is assembled with the valve body having an operating shaft extending through the trunnions and a movable valve disc connected to the shaft and adapted to be moved to a position in sealing contact throughout its periphery with a gasket interiorly of the inner ring. The inner diameter of the gasket is slightly smaller than the outer diameter of the valve disc which rotates within the valve body. Provision may be made to minimize any

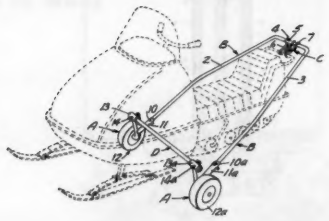
reduction in the inner diameter of the gasket incident to expansion of the gasket material from the heat of high temperature liquids passing through the valve.

3,667,727
SEAT FOR BALL OR GATE VALVES
Billy W. Bowden, P.O. Box 308, Hammond, La. 70401
Continuation-in-part of abandoned application Ser. No. 852,420, Aug. 22, 1969. This application May 10, 1971, Ser. No. 141,721
Int. Cl. F16k *5/20*
U.S. Cl. 251—172 **6 Claims**



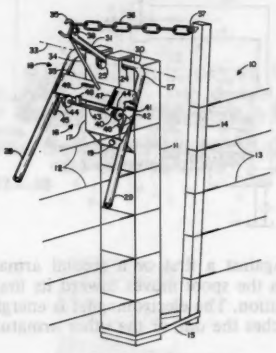
A seat for a ball or gate valve includes an insert which maintains a constant sealed contact with the ball or gate no matter what pressure differential exists between line pressure and the valve body cavity pressure.

3,667,728
SELF-LOADING DOLLY
Herbert J. Garelick, St. Paul, Minn., assignor to Garelick Mfg. Co., St. Paul, Minn.
Filed Aug. 21, 1970, Ser. No. 65,796
Int. Cl. B62b *1/06*
U.S. Cl. 254—8 R **1 Claim**



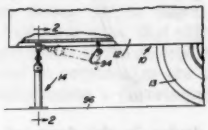
Apparatus for lifting a vehicle, such as a snowmobile, from the ground, whereby it may be transported or repositioned; said apparatus being easily operable by one person. The apparatus includes a U shaped handle assembly, the legs of which are spaced apart sufficiently far to comfortably span the width of a snowmobile. The tip of each leg is provided with a wheel assembly including an angularly formed structure which, in combination with a tie bar, functions to lift the snowmobile upwardly, when the handle assembly is depressed. In use, the apparatus is moved along the length of the snowmobile, with a wheel assembly on each side of the snowmobile. When the apparatus has been brought to a point just beyond the center of gravity of the snowmobile the tie bar is inserted through fittings on the wheel assembly. The front end of the snowmobile will then be lifted when the handle assembly is pressed downwardly. The rear end of the snowmobile may then be easily lifted and supported, off the ground, by attachment to the handle assembly.

3,667,729
GATE CLOSURE APPARATUS
Raymond J. Hinkel, Arena, N. Dak. 58413
Filed Apr. 20, 1970, Ser. No. 30,008
Int. Cl. B66f *3/00*
U.S. Cl. 254—77 **5 Claims**



Wire gate closure and tensioning apparatus comprising a frame mounted on a stationary fence post and pivotally carrying a take-up mechanism which engages one end of a chain or cable, the other end of which joins with a moveable end of the gate. The take-up mechanism includes a handle on each side of the fence for drawing the moveable end of the gate toward the stationary post. A latch maintains the take-up mechanism in position when the gate is closed.

3,667,730
QUICK ACTION JACK
Alan F. Kollmar, 495 Graymont Drive, Santa Rosa, Calif. 95405
Filed May 8, 1970, Ser. No. 35,689
Int. Cl. B60s *9/02*
U.S. Cl. 254—86 R **10 Claims**

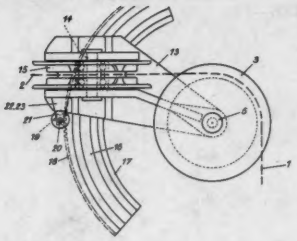


An upright support jack structure including a lower base portion and an upper screw portion partially telescoped downwardly into the upper end of the base portion. A radially expanded segmental thrust nut is supported within the upper end portion of the base portion against rotation relative thereto and the base portion includes means operative from the exterior of the base portion for radially inwardly shifting the segments of the thrust nut into threaded engagement with the screw portion of the jack. When the segments of the thrust nut are radially inwardly shifted into threaded engagement with the screw portion the thrust nut segments are supported from the base portion against downward movement relative thereto and accordingly, rotation of the upper screw portion relative to the base portion when the thrust nut is threadedly engaged with the screw portion will cause the screw portion to be elevated relative to the base portion.

3,667,731
CHAIN GUIDING APPARATUS

Jean-Louis Corgnet, Boulogne-Billancourt, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 11, 1969, Ser. No. 884,438
Claims priority, application France, Dec. 11, 1968, 177,682
Int. Cl. B66d 1/38
U.S. Cl. 254—190 R 1 Claim

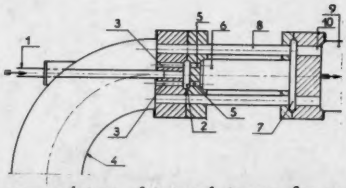


An anchor chain guide having at least two mutually perpendicular pulleys with the bearing support of one journaled on the shaft of the other so that the central or symmetry plane of each pulley is tangent to the entry groove of the other. In one embodiment the bearing support for one of the pulleys slides on a circular track whose center coincides with the axis of the other pulley. In another embodiment the bearing support mounts a pair of tangent pulleys in the same plane and is journaled for rotation about the horizontal shaft of a third pulley. With both arrangements the anchor chain always lies in the central plane of both pulleys around which it is guided, thus eliminating lateral stresses and undue frictional wear, and preventing the chain from jumping over the pulley cheeks.

3,667,732
APPARATUS FOR PRODUCING A HOMOGENEOUS MIXTURE

Pierre Lejeune, Grenoble, France, assignor to Creusot-Loire, Paris, France

Filed Aug. 20, 1970, Ser. No. 65,363
Int. Cl. B01f 5/02
U.S. Cl. 259—4 3 Claims



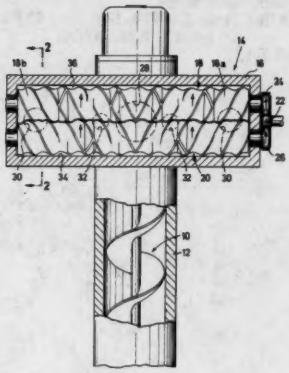
A homogeneous mixture of two substances, for example a fluid suspension of fibres and a diluent in the manufacture of non-woven fabrics or paper pulp, is produced from a mixture of the two substances and injecting the mixture through a plurality of ducts into a dilution chamber.

3,667,733
DEVICE FOR THE PLASTICATION OF POWDERY PLASTIC MATERIALS

Rudolf Paul Fritsch, Goslarer Str. 58, Stuttgart-Weilimdorf, Germany

Filed Jan. 27, 1971, Ser. No. 110,115
Claims priority, application Germany, Jan. 28, 1970, P 20 03 593.2
Int. Cl. B01f 7/08
U.S. Cl. 259—6 17 Claims

A device for the pressureless plastication of powdery plastic materials, which can be used in front of a conventional single screw extruder, and which includes two axially parallel screws, located in a housing and having an essentially identical flight gradient, which almost completely engage into each other and can be rotated in the same direction. Each screw is shaped to provide sealing ridges which close the conventional screw threads and

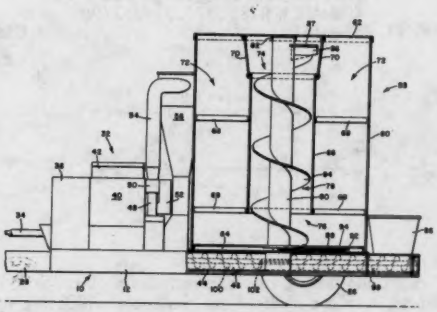


which engage with correspondingly shaped passageways provided in the flights of the adjacent screw, whereby the plastication can be carried out with only partially filled screw threads, and a constant sealing engagement of the screws is insured. The trapped air and the developing gases can escape through vapor outlets provided in the housing.

3,667,734
FEED-MIXING APPARATUS

Arnold Burton Skromme, Moline, Ill., Harold Richard Lindstrom, Des Moines, Iowa, Etlar August Henningsen, Geneseo, and Royal Lowell Beldin, East Moline, Ill., Donald Thomas Sorlie, Ankeny, Iowa, and Elmer Richard Eckert, Horicon, Wis., assignors to Deere & Company, Moline, Ill.

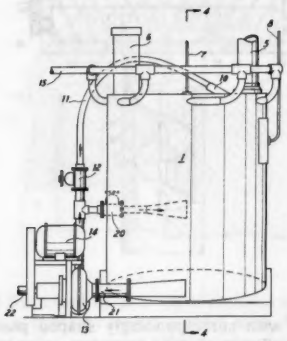
Filed Feb. 23, 1971, Ser. No. 118,050
Int. Cl. B01f 15/02
U.S. Cl. 259—44 22 Claims



Feed-mixing apparatus including a cylindrical tank having a substantially horizontal bottom, a mixing auger contained within a vertical tubular housing mounted concentrically within the tank, and a horizontal blade fixed at one end to the lower portion of the auger and having an outer end extending in close proximity to the tank wall,

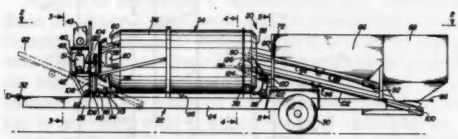
the blade being operable to sweep across the bottom of the tank as the auger is rotated and thereby promote mixing of the material contained therein.

3,667,735
CENTRIFUGAL CEMENT SLURRY MIXER
Maxwell G. Hood, St. Ives, New South Wales, Australia, assignor to Fowler Rex Pty. Limited, Brookvale, New South Wales, Australia
Filed June 3, 1970, Ser. No. 43,002
Int. Cl. B28c 5/06
U.S. Cl. 259—151 5 Claims



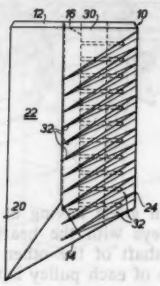
An apparatus for mixing cement-water slurry in which a tank having an annular mixing chamber is disposed about a core and a flexible hollow cylinder mounted above the core has flexible walls for the introduction of pulsating air into it. Tangentially located nozzles admit water to the upper part of the chamber. Cement is also introduced into the upper region of the chamber near the flexible pulsating wall. The slurry mixed in the chamber is recirculated from a suction outlet near the bottom of the chamber to an intermediate level via a valve which can deliver water alone or slurry from within the chamber or slurry from the suction outlet.

3,667,736
MOBILE MIXING MACHINE
Dale E. Carroll, 13864 Putney Road, Poway, Calif. 92064
Filed Aug. 28, 1969, Ser. No. 853,770
Int. Cl. B28c 5/20, 5/42, 7/06
U.S. Cl. 259—161 3 Claims



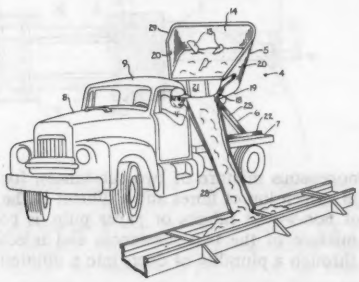
A mobile mixing machine includes a plurality of containers, one for each of the materials which are to be mixed. Superimposed conveyors are disposed below the containers, one conveyor extending rearwardly farther than the other. The outlet of one of the containers is disposed rearwardly of the rear end of the other conveyor. The conveyors move the materials toward a mixing chamber, the latter being preferably of the rotary type, the axis of which extends horizontally.

3,667,737
ENTRAINMENT OF A LIQUID MEDIUM OR OTHER ADDITIVE IN A LIQUID OR OTHER FORMULATION
Alan Colin Scott Howe, Hemel Hempstead, England, assignor to John Laing & Son Limited, London, England
Filed Nov. 28, 1969, Ser. No. 880,682
Claims priority, application Great Britain, Nov. 30, 1968, 56,951/68
Int. Cl. B28c 5/10
U.S. Cl. 259—164 2 Claims



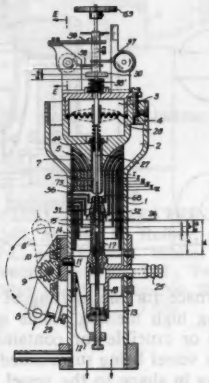
A cavitation element for inducing cavitation in, for example, a wet concrete mix. The element has a smooth upstream profile and a bluff downstream profile with formations on its upper surface which induce a corrugated shape to the envelope of the cavitation immediately downstream of the bluff profile. An inlet within the element communicates with a number of apertures opening into the bluff profile whereby a jet, or jets, of fluid or other additive are supplied through the apertures into cavitation induced by the bluff profile.

3,667,738
DUMP BODY FOR CONCRETE MIX
Glenway Maxon, Jr., Milwaukee, Wis.
Filed Mar. 11, 1971, Ser. No. 123,262
Int. Cl. B28c 5/18
U.S. Cl. 259—171 12 Claims



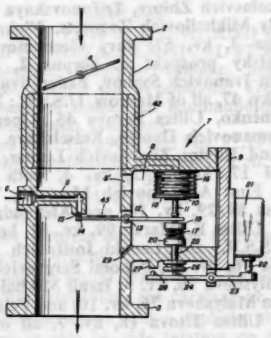
A frame structure tiltably supporting a dump body is removably mounted on a flat bed truck. The body side walls converge toward a discharge outlet at one end of the body, from a zone nearer its other end, and also converge towards said other end from said zone. Its bottom wall inclines upwardly towards the outlet from said zone. Preferably the body is mounted with its plane of symmetry oblique to the longitudinal centerline of the truck chassis, discharge outlet forwardly and at the driver's side; but means are disclosed for securing it to a truck in several orientations.

3,667,739
PROCESS AND APPARATUS REGULATING THE FUEL-AIR MIXTURE IN INTERNAL COMBUSTION ENGINES OPERATING WITH CARBURETORS
Franz Menke, Neckargemund, Germany, assignor to Eltro GmbH & Co., Heidelberg, Germany
Filed Dec. 9, 1969, Ser. No. 883,433
Int. Cl. F02m *1/10, 7/04*
U.S. Cl. 261—1 15 Claims



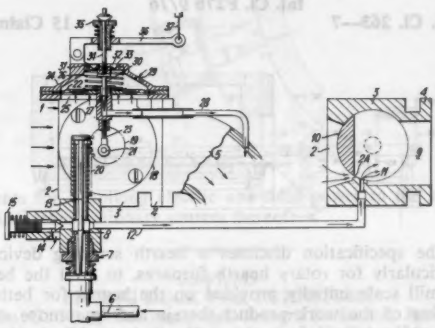
A process and apparatus for regulating a fuel-air mixture for internal combustion engines comprises a plurality of telescoped tubes defining Venturi passages for discharging air at constant velocity in the region of a variable fuel inlet. The inlet and air passages are conjointly regulated to be correspondingly varied in size to change engine operation. The size of the fuel inlet is additionally and independently regulated, in superposition with the above regulation, in response to temperature and pressure changes during variation of engine operating conditions.

3,667,740
CARBURETOR
Sten-Erik Mortstedt, Ostra Bergsgatan 11, 611 00 Nykoping, Sweden
Filed Aug. 1, 1969, Ser. No. 846,904
Claims priority, application Sweden, Mar. 14, 1969, 3,595/69
Int. Cl. F02m *1/10, 7/16*
U.S. Cl. 261—39 A 6 Claims



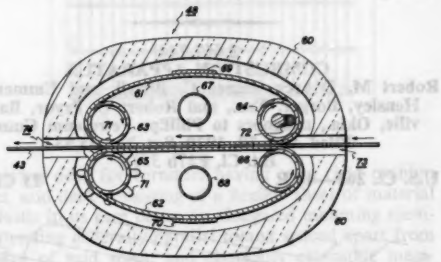
A fuel-injection type carburetor for internal combustion engines, including means for automatically varying the rate of fuel flow into the air pipe in relation to the air pressure within said pipe and including the possibility for temperature and atmospheric pressure compensation.

3,667,741
CARBURETTERS FOR INTERNAL COMBUSTION ENGINES
Peter P. Swatman, Solihull, England, assignor to British Leyland (Austin-Morris) Limited, Birmingham, England
Continuation of application Ser. No. 791,399, Jan. 15, 1969. This application Aug. 28, 1970, Ser. No. 67,988
Claims priority, application Great Britain, Jan. 25, 1968, 3,856/68; May 9, 1968, 21,917/68
Int. Cl. F02m *7/04*
U.S. Cl. 261—50 A 8 Claims



A carburetter of the controllable jet, automatic variable-choke type has a single main control member (e.g. a rotatable shutter) which regulates the effective cross-sectional area of the choke and also supplants the usual throttle disc.

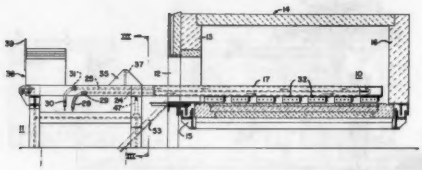
3,667,742
FIXING ARRANGEMENT
Roman C. Kamola, North Rose, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 28, 1970, Ser. No. 101,730
Int. Cl. G03g *13/20, 15/20*
U.S. Cl. 263—6 E 6 Claims



Apparatus for fusing electroscopic toner images onto a support in which a pair of elastically deformable shell members of a generally cylindrical configuration are each supported in a deformed generally elliptical configuration about a pair of generally parallel spaced roller members with the roller members being biased in a direction generally along the minor axis of the respective elliptical configuration to further deform at least a portion of the elliptical surface of one of the shell members against at least a portion of the elliptical surface of the other of the shell members thereby providing an extended nip or area of contact between the shell members. A source of heat energy associated with at least one of the shell members produces a heating of the shell members to an elevated

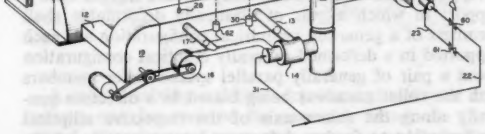
temperature and as the heated shell members are advanced about the roller members in the deformed configuration a support member having unfused electroscopic toner images thereon will be advanced therebetween to produce at least a partial melting of the toner images on the support within the extended nip area.

3,667,743
HEARTH SCRAPING DEVICE
Edward J. Kovalcik and Edward D. Dowling, Pittsburgh, Pa., assignors to Pullman Incorporated, Pittsburgh, Pa.
Filed Feb. 9, 1971, Ser. No. 113,898
Int. Cl. F27b *9/16*
U.S. Cl. 263—7 **15 Claims**



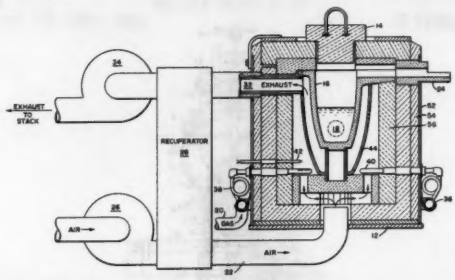
The specification discloses a hearth scraping device, particularly for rotary hearth furnaces, to level the bed of mill scale initially provided on the hearth for better seating of the work product therein and to remove excess scale derived from the work product while holding the furnace temperature sufficiently high that the mill scale is loose and manageable. The device comprises a counterbalanced cantilever type boom, carrying a series of canted scraper blades, inserted horizontally through a clean-out door into the furnace substantially along a radial line. When in installed position, the boom is hingedly supported at its outer end on a pedestal structure and raised and lowered under manual control by a jack to a position for appropriate scraping action by the scraper blades which, in cooperation with the rotation of the hearth, causes progressive movement of the scale from blade to blade radially outward through the clean-out door. The boom assembly has suitable passages provided therein for water circulation and consequent cooling to withstand exposure to heat.

3,667,744
COMBUSTION APPARATUS
Robert M. D'Arcy, James C. Birtell, and Emmery P. Hensley, Borger, Tex., and Robert C. Pryor, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Aug. 20, 1970, Ser. No. 65,533
Int. Cl. F27b *3/10*
U.S. Cl. 263—40 R **11 Claims**



An apparatus for establishing controlled temperatures and oxygen content of a gas for removal of deposits from equipment by oxidation. A chamber in which the equipment to be cleaned is positioned is adapted with gas circulating ductwork and with a burner for the introduction of hot gases of controlled oxygen content.

3,667,745
CRUCIBLE FURNACE
Lazaros J. Lazaridis, Lincoln, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.
Filed Apr. 15, 1970, Ser. No. 28,860
Int. Cl. F27b *14/14*
U.S. Cl. 266—33 R **7 Claims**

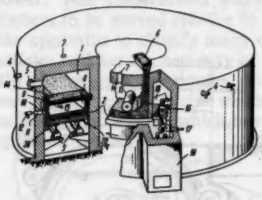


A crucible furnace for the melting of metals or other substances having high melting points which includes a refractory vessel or crucible for containing the material to be melted, the vessel being surrounded by a baffle generally conforming in shape to the vessel. External to the baffle is a chamber at the base of which fuel and combustion air, at times preheated, are separately introduced, tubulently mixed and ignited. The baffle is perforated in a pattern of holes which serve to direct combustion gases in the form of jets upon the outer wall of the vessel. This action enhances heat transfer by disrupting stagnant boundary layers of gas along the wall of the crucible, contributes to the uniformity of heat distribution in the crucible, and contributes in achieving high overall heat transfer coefficient. The products of combustion are drawn out of an annular space about the upper periphery of the crucible which is sealed so that no contact with the contents of the crucible is possible. The products of combustion may also be passed through a recuperator when preheating of the incoming combustion air is desirable to increase efficiency and flame temperature.

3,667,746
FURNACE FOR CONTINUOUS HEAT PROCESSING OF VARIOUS MATERIALS
Gleb Nikolaevich Makarov, Ulitsa Gotvalda 14, kv. 53; Boris Nikolaevich Zhitov, Trifonovskaya ulitsa 61, kv. 3; Anatoly Mikhailovich Zagorets, Nizhne-Pervomaiskaya ulitsa 3, kv. 57; Jury Germanovich Korolev, Universitetsky prospekt 6, korpus 2, kv. 68; and Konstantin Ivanovich Syskov, Federativny prospekt 6, korpus 6, kv. 47, all of Moscow, U.S.S.R.; Jury Yakovlevich Filonenko, Ulitsa Perova 45, Lipetsk, U.S.S.R.; Semen Semenovich Dvorin, Eniseiskaya ulitsa 16/21, kv. 27; and Ruvim Zinovievich Lerner, Ulitsa Marii Ulvanovoi 17, korpus 2, kv. 4, both of Moscow, U.S.S.R.; Fuat Akhtemovich Mustafin, Tagil, Gazetnava ulitsa 80/29, kv. 10; and Alexandr Semenovich Semenov, Ulitsa K. Marxa 99, kv. 52, both of Nizhny Tagil, U.S.S.R.; and Leonid Iosifovich Erkin, Ulitsa Malysheva 76, kv. 36; Nikolai Sergeevich Grayaznov, Ulitsa Malysheva 76, kv. 5; Izrail Mikhailovich Lazovsky, Ulitsa Malysheva 76, kv. 10; and Petr Yakovlevich Nefebov, Ulitsa Titova 18, kv. 7, all of Sverdlovsk, U.S.S.R.
Filed Jan. 29, 1970, Ser. No. 6,800
Int. Cl. F27b *17/00*
U.S. Cl. 266—21 **5 Claims**

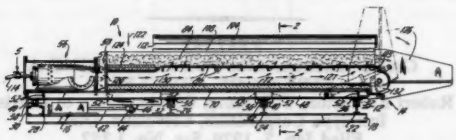
A furnace for continuous heat processing of various materials comprising a ring-shaped hearth with a platform for placement of the material to be processed, the

hearth being rotatable in an annular passage of the furnace. The hearth is hollow and has an inner chamber for



passing combustible gases from a burner to the material via apertures in the platform.

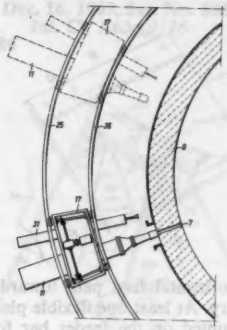
3,667,747
CONVEYOR HEATER
Robert W. Graybill, Stanley C. Reiber, and Donald W. Nace, York, Pa., and Ellis S. White, Glyndon, Md., assignors to Fecor Industries, Ltd., York, Pa.
Filed May 19, 1970, Ser. No. 38,849
Int. Cl. F27b *1/20*
U.S. Cl. 266—24 **10 Claims**



An apparatus for preheating a scrap charge before it is melted in a furnace includes a combustor and a plenum which are installed on a vibratory conveyor for movement conjointly therewith. The combustor, which has a non-refractory combustion chamber lining which is cooled by the incoming air, delivers heated air under pressure to the plenum located under the conveyor trough, from which the heated air is forced through a plurality of passageways in the conveyor surface to the scrap charge carried in the conveyor trough. After the scrap is preheated, a gate-ramp at the downstream end of the conveyor lowers to deliver the scrap to the furnace.

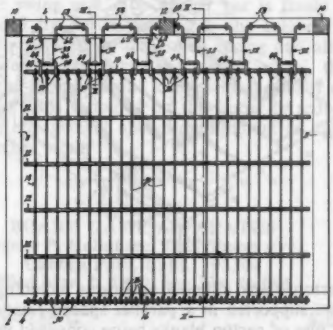
3,667,748
ARRANGEMENT FOR OPENING AND CLOSING TAPHOLES OF METALLURGICAL FURNACES
Herbert Dienenthal, Obersdorf-Rodgen, and Theodor Zimmermann, Siegen im Westphalia, Germany, assignors to Dango & Dienenthal Kommanditgesellschaft, Siegen im Westphalia, Germany
Filed Feb. 13, 1970, Ser. No. 11,117
Claims priority, application Germany, Feb. 25, 1969, P 19 09 326.6
Int. Cl. C21b *7/12*
U.S. Cl. 266—42 **3 Claims**

Apparatus for opening and closing tapholes of metallurgical furnaces, particularly rotatable hearth furnaces and furnaces having plural tapholes, includes a carriage or trolley, a track supporting the carriage or trolley, and a taphole drilling machine and a taphole plugging machine supported in side by side relation on the carriage or trolley. The tracks run at a uniform spacing from the wall of a furnace, and a centering arm on the apparatus cooperates with guides on the furnace, one adjacent each taphole, for proper location of the taphole drilling machine and the taphole plugging machine. The tracks may be either overhead tracks or may be ground supported tracks. The apparatus includes various arrange-



ments for supplying electric and fluid power to the machines from stationary sources thereof.

3,667,749
SPRING DECK FOR FURNITURE
John G. Platt, Carthage, and Robert O. Isaacs, Joplin, Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.
Filed July 23, 1970, Ser. No. 57,458
Int. Cl. F16f *3/02*
U.S. Cl. 267—112 **14 Claims**

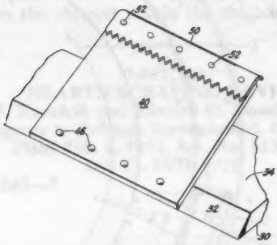


A spring deck for furniture having open rigid cushion frames, said deck consisting of a flexible sheet of material non-elastic in its own plane, an elongated mounting member extending generally parallel to and spaced apart from one edge of said sheet, and elastically extensible members extending between and interconnecting said mounting member with the adjacent edge of said sheet, said mounting member and the distal edge of said sheet being adapted to be firmly affixed to opposite sides of a furniture frame.

3,667,750
PLASTIC SPRING FEEDER PLATE
Frederick R. Kuehn, Baltimore, Md., assignor to Koppers Company, Inc.
Filed Nov. 23, 1970, Ser. No. 91,832
Int. Cl. B65h *5/16*
U.S. Cl. 271—44 R **5 Claims**

A spring feeder plate consists of a synthetic organic solid plastic that is highly resistant to ruptures induced by flexing of the plate during reciprocation of a spring

feeder bar in sheet feeding machines. In such machines, paper board sheets are fed from beneath a stack of such sheets by a reciprocating feeder bar which extends across the width of a feed table. The sheets are fed along a



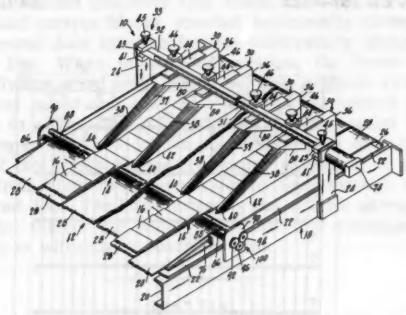
substantially horizontal feed path toward adjacent processing machinery. At least one flexible plastic spring feeder plate is mounted on the feeder bar for engaging the trailing edge of each successive bottom sheet as the bar reciprocates.

3,667,751

CARTON BLANK ALIGNING APPARATUS

Peter Zernov, Wauwatosa, Thomas H. Gabel, Menomonee Falls, and Norman C. Abler, Wauwatosa, Wis., assignors to Zerand Corporation, New Berlin, Wis.

Filed Dec. 2, 1970, Ser. No. 94,481
Int. Cl. B65h *9/04*
U.S. Cl. 271—49 **16 Claims**



A carton blank aligning apparatus including a number of plows supported in a parallel spaced relation on each side of files of carton blanks being conveyed in a shingled relation on a conveyor, the plows being supported for vibratory motion on a pair of leaf springs. A vibrating device is used to vibrate the plow support to realign the edges of any canted carton blanks with the edges of the files. A ramp is provided in the conveyor to elevate the leading edge of the carton blanks as they move between the plows, and a roller is used to aid the movement of the blanks as they enter the space between the plows.

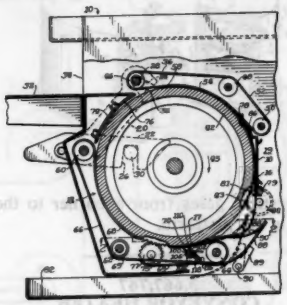
3,667,752

DOCUMENT TURNAROUND WITH IMPROVED AUTOMATIC SKEW CORRECTION

Casimir S. Samczyk, Franklin Park, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 855,891, Sept. 8, 1969. This application Nov. 6, 1969, Ser. No. 874,552
Int. Cl. B65h *9/06*
U.S. Cl. 271—53 **4 Claims**

This invention is directed to apparatus for repeatedly transporting an original document along a straight line path through an exposure station of an office copying machine. The transport apparatus includes a movable member in the normal path of movement of the leading edge of the original document. The leading edge strikes the movable member during each cycle of the document



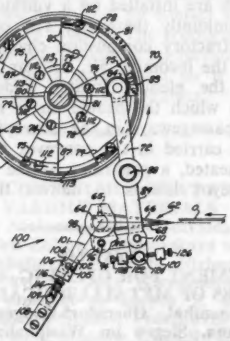
through the transport apparatus, causing localized buckling of the document thereby automatically correcting a skew condition which the document may acquire as a result of improper insertion into the copying machine or misalignment of the document transport members.

3,667,753

GATE MECHANISM FOR PROCESSING A STREAM OF ARTICLES

Robert K. Norton, Twinsburg, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

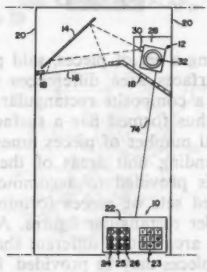
Filed Jan. 7, 1970, Ser. No. 1,257
Int. Cl. B65h *29/60*
U.S. Cl. 271—64 **10 Claims**



An improved apparatus for processing a stream of articles made of sheet material includes an article classifying gate which has a first position in which it directs a flow of articles of one class to a first means for receiving the articles and a second position in which it directs the flow of the articles of another class to a second means for receiving the articles. The gate has a link associated therewith which is movable by a plurality of spaced apart cam members which move the gate between its first and second positions in a timed relationship with the flow of articles past the gate. The link is operable to move the gate when a cam follower mounted thereon engages with one of the cam members and is ineffective to control the position of the gate when the cam follower is not engaged with one of the cam members. A spring loaded toggle linkage is provided for maintaining the gate in a

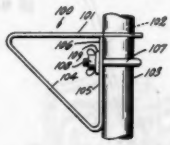
selected position to which it has been moved by the cam members during the portion of the operation of the apparatus in which the cam members are not engaged with the cam follower. This construction allows the spaced apart cam members to be moved relative to each other so as to enable the apparatus to classify many different types and sizes of articles without the necessity of long time delays and costly change-over procedures every time it is desired to classify a new set of articles which are different from the preceding set of articles which have been classified by the apparatus.

3,667,754
MULTIPLE SWITCH AMUSEMENT PROJECTION DEVICE AND METHOD
Stanley S. Coole, Cleveland, Ohio, assignor to Ohio Displays, Inc., Cleveland, Ohio
Filed Oct. 15, 1970, Ser. No. 80,997
Int. Cl. A63j 5/00
U.S. Cl. 272—8 P **8 Claims**



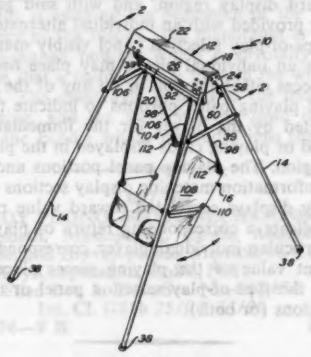
A viewing screen and a console are provided including a plurality of switches arranged in three groups of three switches in each group. Closing of one switch in each group causes a plurality of images to be projected on the screen. The device gives the appearance that the individual switches control image selection. In reality, the switches simply activate a slide change mechanism of a slide projector to project a predetermined composite image carried by a single slide onto the screen.

3,667,755
ADJUSTABLE STILT
Joseph H. Manning, 711 Beach Road, Apt. 200, Sarasota, Fla. 33581
Filed May 18, 1970, Ser. No. 38,066
Int. Cl. A63b 25/00
U.S. Cl. 272—70.1 **4 Claims**



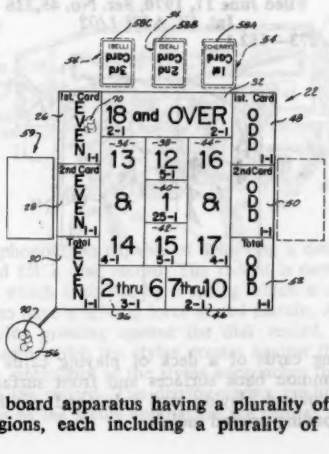
Adjustable stilts are provided each comprised of a vertical pole and a foot bracket adjustably mounted thereon by means of at least one U-bolt encompassing the pole and having its ends engaging and affixed to the bracket by means of nuts or thumbscrews, thereby safely securing the bracket to the pole and permitting rapid height adjustment of the bracket. A second U-bolt spaced from the first may be utilized to support one end of the bracket. Alternatively, in a preferred embodiment utilizing only a single U-bolt, the upper portion of the step is supported by providing an opening at the inner end of the step through which the pole is disposed.

3,667,756
MOTOR OPERATED CHILD'S SWING
Edmund Barrett, Narberth, Pa., assignor to Jenkintown Metal Products, Inc., Jenkintown, Pa.
Filed Dec. 16, 1969, Ser. No. 885,525
Int. Cl. A63g 9/16
U.S. Cl. 272—86 **9 Claims**



A child's swing operated by a spring motor. The swing includes a frame, upstanding legs supporting the frame and a swing seat suspended from the frame. The spring motor includes a coiled spring having one end secured to a ratchet wheel and the other end secured to the frame. A first pawl is pivotally mounted on the frame and a second pawl is pivotally mounted on a hanger bar which supports the swing seat. The hanger bar is freely pivotally suspended by a rod secured to the ratchet wheel. The swing is powered by the coiled spring and alternate engagement of the pawls in the ratchet wheel, thereby unwinding the spring. Sound deadening means is associated with the pawl mounted on the frame to reduce the noise of the engagement and disengagement of the pawl with the ratchet teeth.

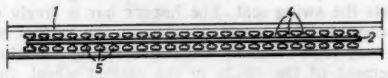
3,667,757
BOARD GAME APPARATUS
Eugene P. Holmberg, 7755 Shoup Ave., Canoga Park, Calif. 91304
Filed Mar. 3, 1970, Ser. No. 16,061
Int. Cl. A63f 3/00
U.S. Cl. 273—135 G **5 Claims**



A game board apparatus having a plurality of visible playing regions, each including a plurality of playing

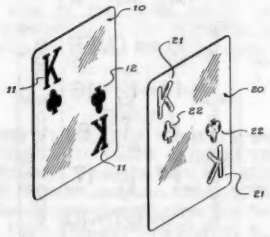
panel portions having a card display region where a particular group of cards corresponding to that player's individual hand is displayed, having a plurality of card information matching display sections and corresponding to information in various combinations which may be displayed by the group of cards (usually three) of a particular player's individual hand when displayed in the playing card display region, and with said game board also being provided with an individual alternate (or additional) type-of-play selection panel visibly marked thereon so that an individual player may place one or more playing pieces either thereon or on any of the previously mentioned playing panel portions to indicate the type of play selected by the player for the immediately subsequent hand of playing cards displayed in the playing card display region. The playing panel portions and the combination information matching display sections each bears and visibly displays correlated reward value ratio markings to indicate a corresponding return of playing pieces to the particular individual player corresponding to the game point value of the playing pieces placed by said player on the type-of-play selection panel or the playing panel portions (or both).

3,667,758
PLASTIC FINS FOR ARCHERY ARROWS
Bjorn R. Bengtsson, Box 71, S–124 21 Bandhagen 1, Sweden
Filed Aug. 6, 1970, Ser. No. 61,697
Claims priority, application Sweden, Aug. 7, 1969, 11,009/69
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 C **1 Claim**



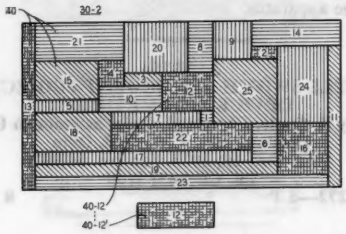
A plastic guide fin for archery arrows, the edge surface of said fin adapted to be secured to the arrow shank by gluing being shaped like a foot having narrowly spaced notches to provide a penetration of glue therethrough and an embedding of the foot portions therebetween whereby a mechanical glue joint is obtained.

3,667,759
PLAYING CARDS WITH CONVENTIONAL BAS-RELIEF INDICIA
Ruth L. Barr, 53 Webster Acres, Webster Groves, Mo. 63119
Filed June 11, 1970, Ser. No. 45,328
Int. Cl. A63f *1/02*
U.S. Cl. 273—152.1 **4 Claims**



Playing cards of a deck of playing cards are made with common back surfaces and front surfaces having raised standard playing card value and suit indicia and corresponding printed indicia.

3,667,760
PUZZLE FORMING REGULAR GEOMETRIC FIGURES FROM A CHANGEABLE NUMBER OF PIECES HAVING SEQUENTIALLY INCREASING SURFACE AREAS
Winston L. Nelson, 24 Erskine Drive, Morristown, N.J. 07960
Filed Jan. 23, 1970, Ser. No. 5,331
Int. Cl. A63f *9/10*
U.S. Cl. 273—157 R **10 Claims**



A puzzle having a set of pieces, said pieces having sequential unit surfaces area differences and being combinable to form a composite rectangular figure. The rectangular figure thus formed has a surface area which is one-half the total number of pieces times the sum of the beginning and ending unit areas of the pieces. An adjustable frame is provided to accommodate larger and smaller numbered sets of pieces forming corresponding larger and smaller rectangular figures. Alternative pieces having the same area but of different shape than individual ones of the pieces may be provided. Respective pieces may be of four different colors so selected that when the pieces form said rectangular figure no pieces of the same color are adjacent each other.

3,667,761
GOLF PUTTER WITH ALIGNING DEVICE
John J. Palotsee, % J. P. Putter & Guide Co., Box 1225, Youngstown, Ohio 44501
Filed Sept. 8, 1970, Ser. No. 70,346
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 A **8 Claims**

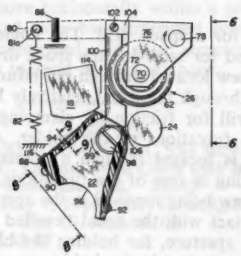
A golf putter includes an enlarged and rearwardly elongated upper portion which is provided with a device for correctly aligning the putter with a golf ball and a hole into which the ball is to be driven. The aligning device consists of an elongated rod, which may be telescoping, attached to the head of the putter and extending normal to the ball striking face of the putter. The rod

may be retained in a V-shaped groove extending across the upper surface of the elongated portion by means of a bar or rod magnet within the putter head immediately below and parallel to the groove. Alternatively, the rod may be positioned in a through bore in the enlarged portion and retained therein either by a bar magnet extending parallel to the rod or by a spring-biased ball engaging a groove in the rod. Markings may be provided on the rod to provide reference points which can be used by the golfer to determine the length of the stroke needed to drive a ball the desired distance. The elongated surface of the enlarged portion is adapted to provide an aiming aid when the rod is detached from the club.

3,667,762
MINIATURIZED TAPE RECORDER

James E. Scheid, Oxnard, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Apr. 6, 1970, Ser. No. 25,771
Int. Cl. G11b *15/29*
U.S. Cl. 274—4 D **7 Claims**

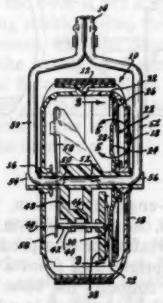


A small, rugged tape recorder especially adapted for use in biomedical research and for aircraft, missile and undersea instrumentation systems where space limitations preclude the use of standard-size equipment. A feature of the design is that tape-to-head contact is independent of tape tension. Short-term speed variations (wow and flutter) do not exceed 1.2% peak-to-peak in the frequency range of zero to 70 hertz.

3,667,763
SIMPLIFIED TALKING TOY

William F. Summerfield, Huntington Beach, and Fleet E. Nuttall, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 1, 1970, Ser. No. 77,158
Int. Cl. G11b *3/00, 3/10, 17/06*
U.S. Cl. 274—9 R **3 Claims**

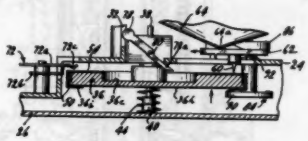


A toy phonograph which includes a speaker diaphragm that has a record groove formed in it so that a firmly supported stylus moving along the groove causes the diaphragm to vibrate and produce sounds of substantial volume. The groove is formed in a spiral and can be played by any one of several styluses located along a circle on a rotatable head. The head slowly rotates as the styluses move along the groove, and the styluses are spaced so that as one stylus is leaving the end of the spiral groove, which lies near the center of the record, the next successive stylus is entering the beginning of the groove at the periphery of the record. The diaphragm is contained in a wheel-shaped housing which is pivotally mounted on a handle that a child can use to push the wheel along the ground. The diaphragm is fixed to the inside of the wheel housing, and the stylus-holding head is fixed to an end of the handle which protrudes into the housing.

3,667,764
TOY PHONOGRAPH MECHANISM

Henry Nemeth, Massapequa, Edwin August Nielsen, Oceanside, and Harvey Berkin, Merrick, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,694
Int. Cl. G11b *25/04, 25/06*
U.S. Cl. 274—9 R **16 Claims**

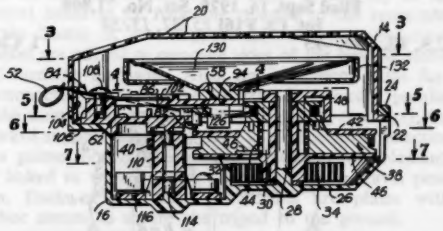


A phonograph for use in dolls, toys, games and the like which includes a record member or disc having plural individual sound grooves on the surface arranged concentrically of each other and a battery-powered, motor-driven, record-playing mechanism arranged to play the messages of the individual sound grooves when the attitude or position of the phonograph is changed, and on a random basis, such that the mechanism appears to function spontaneously and produces any one of the plural messages.

3,667,765
TOY PHONOGRAPH

Katsumi Watanabe, 376 Ozenji, Kawasaki-shi, Japan

Continuation-in-part of application Ser. No. 748,283, July 29, 1968. This application Jan. 29, 1970, Ser. No. 6,761
Int. Cl. G11b *25/04, 17/06*
U.S. Cl. 274—14 **10 Claims**



A toy phonograph capable of achieving a constant rotary speed for a disk record. The record is carried by a turntable which is driven by a spring which is manually actuated to have a driving force stored therein. A pick-up has a stylus pressing against the disk record, and the pressure with which the stylus presses against the record gradually diminishes as the stylus approaches the central region of the record. The driving spring gradually runs down also as the stylus approaches the central region of

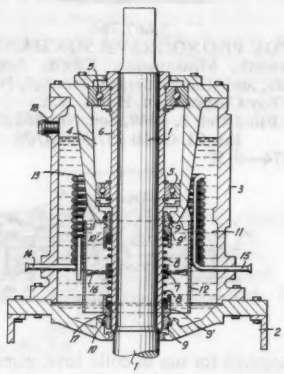
the record, so that in this way the drop in the pressure of the stylus on the record compensates for the running down of the spring to contribute toward the maintenance of a substantially constant rotary speed for the record.

3,667,766

SEALING AND GUIDING DEVICE FOR A SHAFT DRIVEN IN ROTATION

Louis Sussmeyer, Rue de Birmingham 222, 1070 Brussels, Belgium

Filed May 28, 1970, Ser. No. 41,314
Claims priority, application Belgium, Mar. 20, 1970, 86,755
Int. Cl. F16j *15/40*; F02f *11/00*
U.S. Cl. 277—22 **3 Claims**



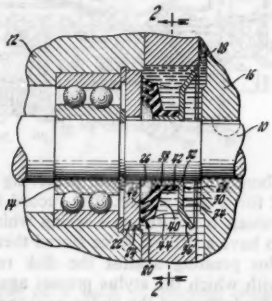
A sealing and guiding device is provided for a shaft driven in rotation and intended to operate in an enclosure under a pressure different from normal atmospheric pressure. The device comprises seals of rigid material arranged to ensure the seal-tightness of the shaft in a container which is contiguous to the working enclosure. The container is filled with a lubricant which is cooled by passing a cooling agent through a coil in the container. The container is pressurized to a value similar to that prevailing in the enclosure. The shaft is supported and guided in guide bearings arranged in a clearance between an indented portion of the container and the shaft.

3,667,767

SEAL WITH VARIABLE SEALING LIP PRESSURE

Thomas W. Bakewell, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 14, 1970, Ser. No. 71,808
Int. Cl. F16j *15/32, 15/54*
U.S. Cl. 277—95 **1 Claim**



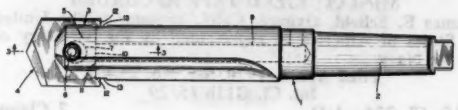
A seal for a liquid filled chamber has a radially open cavity behind a flexible wall which carries annular sealing lips. Under static conditions the cavity is filled with liquid under positive pressure and increases the sealing lip contact pressure. Under dynamic conditions the liquid is expelled from the cavity, the pressure of the liquid in the seal area is reduced, and the sealing lip contact pressure is lighter.

3,667,768

HOLDER FOR SPADE DRILL

William H. Stokey, Cleveland, Ohio, assignor to Allied Machine & Engineering Corporation, Cleveland, Ohio

Filed Apr. 9, 1970, Ser. No. 26,839
Int. Cl. B23b *27/16*
U.S. Cl. 279—83 **5 Claims**



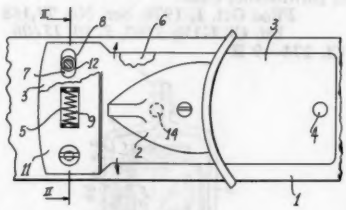
A holder for a spade drill. The holder has the usual bifurcated end for receiving the spade drill and the usual clamping screw located through the bifurcated end of the holder and through the usual relatively large aperture in the spade drill for frictionally clamping the spade drill between the furcations of the holder. A setscrew with conical end is located through a diametrically disposed tapped opening in one of the furcations, the conical end of the setscrew being received in the aperture in the blade drill, in contact with the usual bevelled edge at the rear side of said aperture, for holding the blade drill against accidental movement in the holder.

3,667,769

SAFETY SKI BINDING

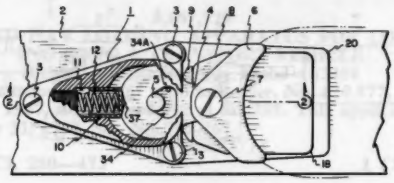
Heinrich Wunder, Rothschwaige, near Dachau, Germany, assignor to Heinrich Wunder KG., Rothschwaige, near Dachau, Germany

Filed Jan. 15, 1970, Ser. No. 3,035
Claims priority, application Germany, Jan. 16, 1969, P 19 01 980.8
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **8 Claims**



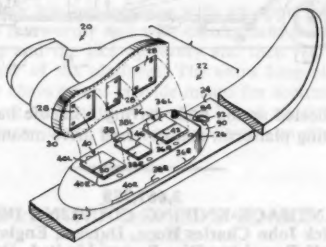
At least one boot-engaging portion, i.e. a heel-and/or toe-engaging portion, is mountable on a ski for pivotal movement under the influence of a predetermined torsional force about an upright axis from a normal operating position in which it connects the boot with the ski, to a laterally displaced release position in which it disconnects the boot from the ski. Mounting means mounts the boot-engaging portion for pivotal movement short of the release position in response to torsional forces smaller than the predetermined torsional force.

3,667,770
SKI-BINDING TOE MECHANISM
John S. Lawrence, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah
Filed Oct. 6, 1970, Ser. No. 78,500
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T 10 Claims



A toe ski safety binding comprising a base support constructed for mounting on a ski and ski boot toe holding means for releasably holding the toe end of a ski boot to said ski, the ski boot toe holding means consisting of a cam plate whose forward end is in rotary contact with a spring-loaded cam follower; the cam plate constrained to move horizontally within a predetermined area and is linked to a base-supported post. Also provided is a cam-controlled skid plate structure to releasably support the toe end of said ski boot.

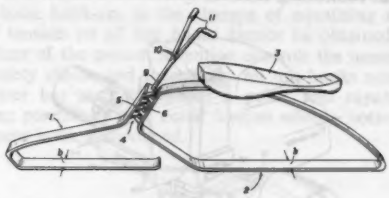
3,667,771
ADJUSTABLE MAGNETIC SKI BINDING
Richard C. Larson, 4420 Great Oak Road, Rockville, Md. 20853
Filed July 7, 1969, Ser. No. 839,584
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 M 20 Claims



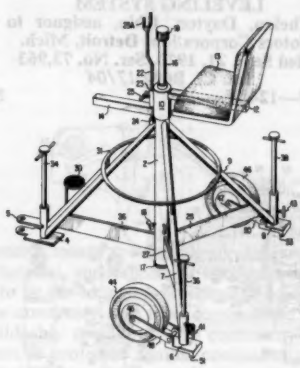
A magnetic ski binding employing a plurality of rotatable bar magnets for attracting magnetically attractable plates in the sole of a ski boot including ski mounted plunger means for rotating the bar magnets from a shunted position in which the boot is not attracted by the magnets to a boot attracting position upon the placing of a ski boot on the plunger means with the plunger means being adjustable to vary the extent of magnet rotation and consequently vary the force with which the boot is attracted to the ski wherein spring means are also provided for moving the magnets to the shunted position to enable an easy removal of the boot from the ski.

3,667,772
SINGLE-TRACK SLED VEHICLE
Heinz Eggert, Moosstrasse 11, Salzburg, Austria
Filed Mar. 25, 1970, Ser. No. 22,512
Claims priority, application Austria, Mar. 26, 1969, A 2,971/69
Int. Cl. B62b *13/04*
U.S. Cl. 280—16 1 Claim

The invention relates to a single-track sled vehicle with a steerable front skid and a framelike rear skid connected to it by a joint and carrying the rider's seat wherein each of the two skids is an integral springing member, preferably elastic synthetic plastic material, these skids being made rigid only in the region of the joint which connects them.



3,667,773
SURVEYOR FIELD TRIPOD
Donald J. Hess, Rte. 1, P.O. Box 268A, Wynne, Ark. 72396
Filed Nov. 17, 1970, Ser. No. 90,255
Int. Cl. F16m *11/42*
U.S. Cl. 280—30 9 Claims

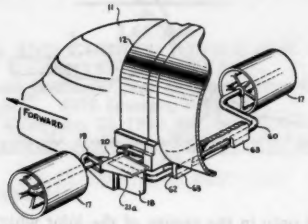


A transportable tripod for holding surveying or other instruments, including a beam frame with three support elements which rest on the ground. A central, vertical beam is hollow to slideably receive an instrument support stem and an inclined beam extends from each support element to connect with the central, vertical beam near its top. A bearing sleeve rests on the top of the vertical beam to be rotatable relative to the remainder of the frame. A seat support and a counter-balancing bracket are affixed to opposite sides of the bearing sleeve and turnable therewith. Also, an instrument guide fork is connected to the sleeve to extend upwardly parallel to the stem above the seat support. During transport, the forward support element is used as a hitch for connection to a prime mover. The rearward two support elements are linked to wheels which are pivoted to a travel position. Each of the support elements are plates with anchor means to secure the tripod to the ground.

3,667,774
HEIGHT CHANGING MECHANISM
Wilbur-Webb Selley, Maitland, Fla., assignor to Vactronics Incorporated, Orlando, Fla.
Filed Nov. 10, 1969, Ser. No. 875,436
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.17 5 Claims

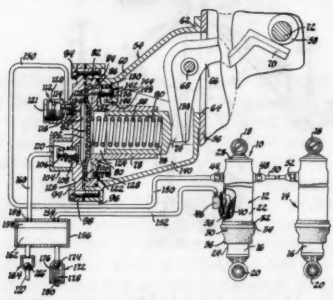
A self-locking height changing mechanism particularly adapted for use with machines, tools, vehicles or the like

equipped with a housing and having an axle whose operative position with respect to the housing is to be selectively changed. This novel mechanism includes the use of a height-controlling member associated with the axle, and



capable of sliding movement as well as rocking movement in the housing. The height-controlling member is normally locked with respect to the housing, but which is easily unlocked by the operator in the course of selectively changing the height of the machine.

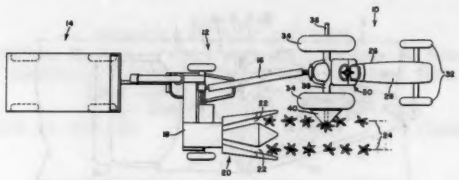
3,667,775
SEMICLOSED LOOP AUTOMATIC LEVELING SYSTEM
James E. Whelan, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 21, 1970, Ser. No. 73,963
Int. Cl. B60g *17/04*
U.S. Cl. 280—124 F **3 Claims**



In preferred form, a vehicle leveling system compressor operated proportional to vehicle engine speed to direct compressed air into a pressurizable air control chamber of a leveler unit. An exhaust opening from the leveler unit is controlled by an undamped on-off exhaust valve continually operated in response to normal vehicle road movements and changes in loading to effect an on-off ratio for exhaust flow from the control chamber into an air collector tank. The air collector tank serves to collect excess air dumped from the leveler unit to prevent exhaust to atmosphere during dynamic operation. An intake valve and a relief valve on the tank and a desiccant cartridge in the tank cooperate to eliminate water in the system during its operation.

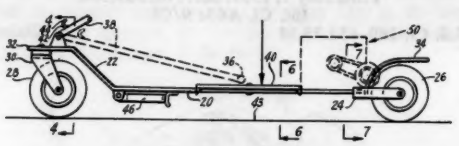
3,667,776
CROP DEFLECTOR ATTACHMENT FOR AGRICULTURAL TRACTORS
Kenneth Earl Murphy, Dike, William Marion Eubank, Waterloo, and Lamar Williams, Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.
Filed June 26, 1970, Ser. No. 50,229
Int. Cl. B60r *27/00*
U.S. Cl. 280—150 R **6 Claims**

An attachment for deflecting crops around that portion of the rear axle of an agricultural tractor projecting outwardly from the ground-engaging drive wheel mounted thereon. The attachment comprises a cone-shaped member releasably mounted on and substantially enclosing the projecting outer end portion of the axle, the member being mounted coaxially with the wheel and including a conical outer surface extending between a relatively large end portion adjacent to the wheel and a relatively small



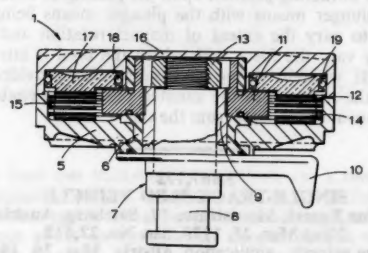
end portion adjacent to the outer end of the axle. The cone-shaped member is mounted on the axle by means of an assembly substantially enclosed by the member and releasably connectible to the axle outer end portion, the assembly including a plurality of radially extending portions on which the member is releasably mountable.

3,667,777
TOWABLE SPRING SCOOTER FOR PRODUCING UNDULATING MOTIONS
Eduardo Enriquez, 6125 Gila Drive, El Paso, Tex. 79905
Filed Dec. 9, 1970, Ser. No. 96,563
Int. Cl. B60d *1/04*; A63g *13/00*
U.S. Cl. 280—480 **2 Claims**



A wheeled spring body having a handle bar assembly, supporting platform, and powered drive means thereon.

3,667,778
ANTIJACK-KNIFING COUPLING DEVICE
Frederick John Charles Hope, Datchet, England, assignor to Self Energising Disc Brakes Limited, Datchet, England
Filed June 18, 1970, Ser. No. 47,362
Claims priority, application Great Britain, June 24, 1969, 31,773/69
Int. Cl. B62d *53/08*
U.S. Cl. 280—432 **5 Claims**



A fifth wheel coupling is provided for articulated vehicles which includes means for resisting "jackknife" movement between the tractor and trailer units of the vehicle. The coupling embodies a substantially standard

king pin engageable with a conventional fifth wheel. Rotatably mounted on the king pin is an annular member which carries a tongue engageable in the slot in the fifth wheel. Braking means are provided, acting between the annular member and the trailer unit for resisting jackknife movement of the vehicle.

3,667,779

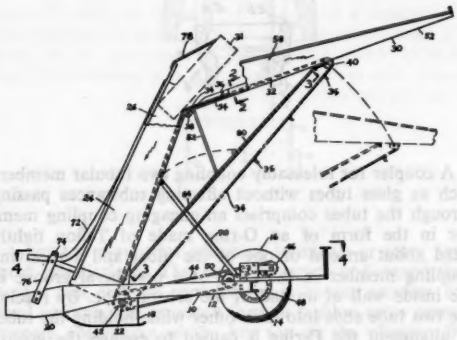
BALED HAY LOADING APPARATUS FOR LOADING ONTO A TRANSPORT VEHICLE

Richard B. Miskin, Ucon, Idaho 83454

Continuation-in-part of application Ser. No. 610,977, Jan. 23, 1967, now Patent No. 3,467,265. This application July 31, 1968, Ser. No. 769,767

Int. Cl. B60d *1/14*

U.S. Cl. 280—473 **1 Claim**



A baled hay loading machine with an upper platform that extends rearwardly and with drive means for loading bales of hay and the like upwardly and then rearwardly along the rear of the platform. The extra long platform and elevator chain means provide means for accumulation of bales along the length of the truck bed waiting for a worker to carry them to desired positions on the truck bed.

3,667,780

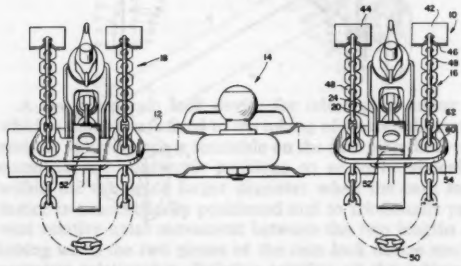
BUMPER HITCH ASSEMBLY TENSION EQUALIZER

John C. Abromavage, Tempe, and James W. Ryden, Phoenix, Ariz., assignors to Advanced Management Engineering & Research Company, Phoenix, Ariz.

Filed Mar. 30, 1971, Ser. No. 129,515

Int. Cl. B60d *1/14*

U.S. Cl. 280—502 **6 Claims**



A bumper hitch assembly tension equalizer, particularly a temporary or "rental" hitch assembly which is easily fastenable to various types of automobile bumpers and particularly suited for use with bumpers that are not straight line. Such bumpers create a need for plural top hooks, two for each bumper attaching clamp, to compensate for bumper deviation from a straight line. In such a four hook hook-up, in the absence of equalizing means equal tension on all top hooks cannot be obtained. The equalizer of the present invention controls the tension on the safety chains and thereby on all top hooks using an equalizer bar pivotable about a point, and capable of shifting position to gain equal tension when a bottom attachment hook is tightened.

3,667,781

CONNECTOR MEANS FOR FLEXIBLE CONDUIT

Le Grand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed June 26, 1970, Ser. No. 50,195

Int. Cl. F16l *11/12*

U.S. Cl. 285—45 **2 Claims**

A connector means for flexible conduit, usable particularly in hospital and especially surgical contexts where tubing is to be cut to length on site. The connector means includes a connector and tube combination wherein the tube is slideable relative to the connector, yet wherein the juncture is protected against contamination. Wedging or constriction means are supplied so as to prevent inadvertent pull-out of the tube relative to the connector. Multiple connector and tube combinations may be operatively associated together in the manner below described, and the connector may be used for completing connection to a number of different, desired objects.

3,667,782

JOINTS FOR CONNECTING PIPES

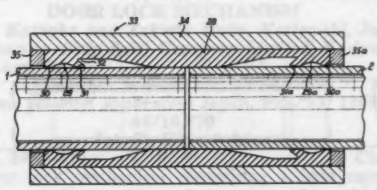
Pierre Viazzi, Bormes-les-Mimosas, France, assignor to Societe Internationale d'Application de Procedes Industriels (S.I.A.P.I.) S.A., Panama, Republic of Panama

Filed Nov. 16, 1970, Ser. No. 89,877

Claims priority, application France, Dec. 3, 1969, 6941772; Apr. 21, 1970, 7014462; June 10, 1970, 7021340

Int. Cl. F16l *17/00*

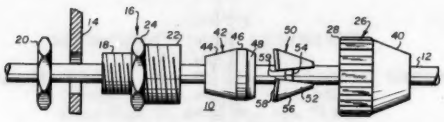
U.S. Cl. 285—110 **12 Claims**



The invention concerns a joint for connecting smooth-ended pipes and comprising a sleeve of resilient material

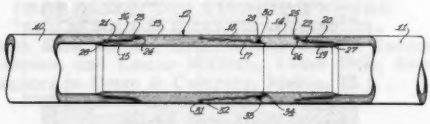
fitted on the adjacent ends of two pipes. The sleeve has, at each of its ends, a circular throat, having, in longitudinal section, a concave portion bonded by two lips. The edges of these lips are located on circles of smaller diameter than the outside diameter of the pipes to be connected and are adapted to move into contact with and to be resiliently deformed by the outer surface of the pipes. The sleeve has further at its central zone a thickened portion having an inner cylindrical surface of circular cross-section having a diameter corresponding to the outside diameter of the pipes and adapted to move into contact with that part of the pipes extending on either side of the line at which the pipes meet.

3,667,783
LIQUID TIGHT STRAIN RELIEF CONNECTOR
Thomas J. Sotolongo, Red Bank, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed July 8, 1970, Ser. No. 53,169
Int. Cl. H02g *3/18*; F16l *41/00*
U.S. Cl. 285—161 **7 Claims**



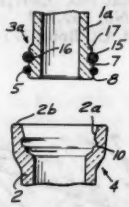
A connector for coupling an electrical conductor to an electrical enclosure providing a liquid tight coupling against moisture and providing strain relief for the conductor. The connector consists of a body member suitably threaded to receive a fastening means for fastening the connector to the electrical enclosure and also for receiving thereupon a gland nut for assembling the overall connector. The transverse passage of the body member is outwardly tapered at a first end for receipt therein of a complementary tapered deformable bushing providing a moisture seal within the connector. In contact with the bushing and housed within a gland nut having an inwardly tapered longitudinal passage is a segmented conductor gripping means having a surface configuration complementary to the inward taper of the gland nut. When assembled the interaction of the body member, gland nut, bushing and conductor grip means is to force the segments of the conductor grip means inwardly securely gripping the conductor to provide strain relief and to further provide for the deformation of the bushing to provide desired moisture sealing within the connector.

3,667,784
DRILL ROD STRUCTURE
Lyle W. Hokanson, Kirkland Lake, Ontario, and John W. McBean, Swastika, Ontario, Canada, assignors to Heath & Sherwood Drilling Limited, Kirkland Lake, Ontario, Canada
Filed Apr. 3, 1970, Ser. No. 25,479
Int. Cl. F16l *15/00*
U.S. Cl. 285—173 **1 Claim**



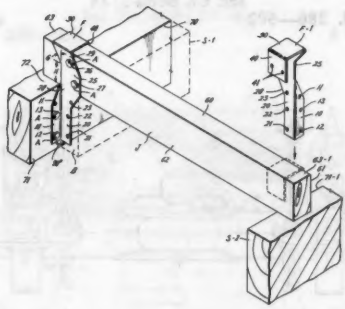
The invention relates to a drill rod structure having aluminum alloy drill pipe and steel couplings. The joints between the pipe and couplings are threaded and the drill rod has substantially uniform inside and outside diameters. The invention relates to drill rods of substantially large size, say, exceeding about two inches in outside diameter.

3,667,785
COUPLER FOR TUBULAR MEMBERS
Martin Kapeker, 41 Decker St., Copiague, N.Y. 11726
Filed May 20, 1970, Ser. No. 39,103
Int. Cl. F16l *21/02, 49/00*
U.S. Cl. 285—231 **7 Claims**



A coupler for releasably coupling two tubular members such as glass tubes without affecting substances passing through the tubes comprises an engaging coupling member in the form of an O-ring made of Teflon tightly fitted about an end of one of the tubes and a receiving coupling member in the form of a peripheral groove in the inside wall of an end of the second tube. By forcing the two tube ends into each other while holding the tubes in alignment the O-ring is caused to engage the groove with a pressure fit. Separation of the tubes is effected by slightly tilting the tube having the engaging coupling member with reference to the other tube thereby forcing the O-ring out of engagement with the groove. Airtight coupling is obtained by providing a second O-ring at the engaging coupling member.

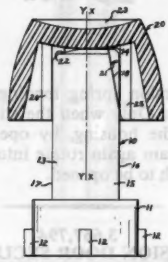
3,667,786
FLOOR JOIST STABILIZER
Henry R. Cooper, 5302 Spencer Highway, Pasadena, Tex. 77505
Filed Apr. 27, 1970, Ser. No. 31,943
Int. Cl. F16b *7/04*
U.S. Cl. 287—20.94 **6 Claims**



A floor joist stabilizer for affixing a joist to a sill upon which mobile homes and the like are situated to establish a simple strong connection therebetween, preventing twisting movement of the joist with respect to the sill and

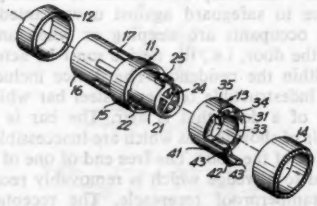
allowing re-use of the stabilizer. The stabilizer is self-positioning on the joist and therefore does not require hammering or any modification in the field by the user.

3,667,787
KEY TOP MOUNT
Norman F. Semour, Coeur d'Arlene, Idaho, assignor to Key Tronic Corp., Spokane, Wash.
Filed Dec. 14, 1970, Ser. No. 97,675
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 H 4 Claims



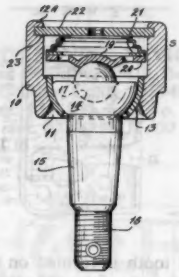
A key top mount for computer terminals or other keyboard installations. The key top recess and supporting plunger post end are complementary to one another. Inclined surfaces are provided in such fashion as to permit alternate positioning of the key top on the plunger. By turning one element 180° relative to the other, the key top can be positioned perpendicular to the post or can be angularly inclined.

3,667,788
CAM LOCK DEVICE FOR TELESCOPING TUBING
William S. Greenwood, Nutley, N.J., assignor to H & G Industries, Inc., Belleville, N.J.
Filed July 7, 1970, Ser. No. 52,903
Int. Cl. F16b *21/09*
U.S. Cl. 287—58 CT 8 Claims



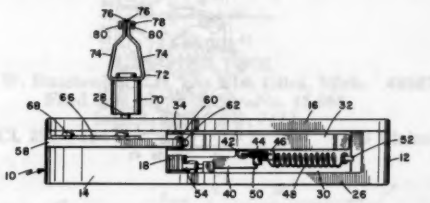
A two-piece cam lock device for telescoping tubing in which a first piece is fixed to the tubing of smaller diameter and the second piece is rotatable on the first piece between eccentric and concentric positions so as to be slideable within the tubing of larger diameter when the cam lock device is concentrically positioned and to frictionally prevent relative axial movement between the two lengths of tubing when the two pieces of the cam lock device are in eccentric relationship. Relative rotation of the tubing is effective to lock and unlock the cam lock device by rotating the two pieces between eccentric and concentric positions.

3,667,789
ASSEMBLY TOLERANCE CONTROL SPACER
James A. McNeely, Manchester, and Ernest R. Russell, Florissant, Mo., assignors to Moog Industries, Inc., St. Louis, Mo.
Filed Oct. 12, 1970, Ser. No. 79,820
Int. Cl. F16c *11/06*
U.S. Cl. 287—87 10 Claims



An assembly tolerance control spacer to absorb or take-up space differences occurring in a product made up of a plurality of components having size or tolerance characteristics which may vary from component to component, the control spacer being included in the assembled product so as to absorb tolerance variations by collapsing more or less to result in a predictable assembly result for the product.

3,667,790
KNOT WINDER FOR TYING FISH HOOKS
John H. Taylor, 2033 Wilbur St. 92109, and Robert C. Pellman, 4505 Quantico 92117, both of San Diego, Calif.
Filed Jan. 25, 1971, Ser. No. 109,227
Int. Cl. B65h *69/04*
U.S. Cl. 289—17 8 Claims

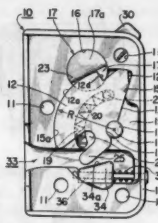


A hand held knot winding tool in which a fish hook is secured in a holder and spun rapidly by a squeeze action drive mechanism, to wind a knot around a leader attached to the hook. Only one hand is necessary to operate the tool, leaving the other hand free to guide and complete the knot.

3,667,791
DOOR LOCK MECHANISM
Kenichi Kazaoka and Takashi Jindo, Kariya-shi, Japan, assignors to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan
Filed Feb. 9, 1970, Ser. No. 9,775
Claims priority, application Japan, Feb. 13, 1969, 44/10,870
Int. Cl. E05c *3/24*
U.S. Cl. 292—216 9 Claims

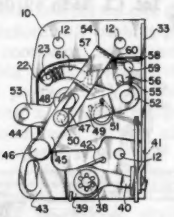
A door lock mechanism comprising a base member fixedly mounted on a door of an automotive vehicle; a recess formed on the base member and having an arc-shaped periphery defining part of the configuration of

the recess; a sector latch member pivotably mounted in the recess, the latch member formed with an arc-shaped peripheral part having the same radius as that of the arc-shaped periphery of the recess. A spring urging the latch member to rotate in one direction with a checker rotatably mounted on the base; a second spring urging the checker to rotate in a direction opposite to the one direction. A



first and a second tooth is formed on the latch member for cooperating in succession with the first and second tooth to keep the latch member in its safety latch and full latch position; and a second and substantially radially directing recess for cooperatingly receiving a striker is mounted on a stationary part of the vehicle when the door is operated in its closing direction.

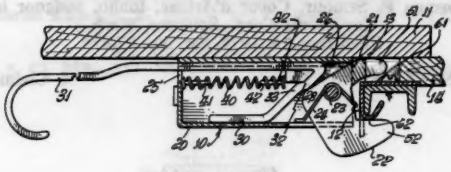
3,667,792
DOOR LOCK MECHANISM
Nozomu Torii, Kariya-shi, Japan, assignor to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan
Filed Mar. 17, 1970, Ser. No. 20,185
Claims priority, application Japan, Mar. 18, 1969, 44/20,618
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **3 Claims**



An improved door lock mechanism which provides fulfilment of the door lock function to be manipulated from inside of the vehicle; door lock function by key operation from outside of the vehicle; automatic release function in the case that the door should be closed following the erroneous locking of the door from inside; and keyless lock operation from outside without use of a manual key.

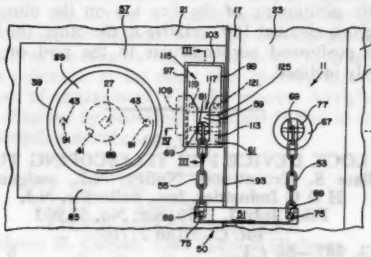
3,667,793
WEDGE-SLIDE LATCH
Andre J. Varrin, 694 Warner Parrott Road, Oregon City, Oreg. 97054; and William L. McCarter, 6420 NE. 41st St; and Henry O. Geisler, 8811 SE. Herbert Court, both of Portland, Oreg. 97232
Filed Sept. 3, 1970, Ser. No. 69,375
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **1 Claim**

A latch having a latching cam pivotally mounted on a pivot pin transverse to an elongated latch housing, the cam having a configuration such that it is rotatably driven into locked position when a closure arm portion engages a catch. The latch housing contains an internally movable slide, which slide is resiliently urged into engagement with the internal part of said cam, but is retractable therefrom by the latch handle. The cam-engaging face of said slide is a surface which is shaped to wedge under a part of the cam, when the latter is counter rotated into locking posi-



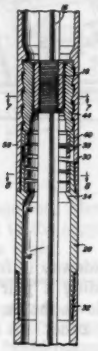
tion, against a torsion spring tending to rotate the cam into open position. Only when the slide is longitudinally retracted within the housing, by operation of the latch handle, does the cam again rotate into unlocked position, permitting the latch to be opened.

3,667,794
ANTI-INTRUSION DOOR SECURITY DEVICE
Ben C. Lentz, Jr., Memphis, Tenn., assignor to Maggie Birdell Lentz, Memphis, Tenn.
Filed May 7, 1971, Ser. No. 141,261
Int. Cl. E05c *17/36*
U.S. Cl. 292—264 **10 Claims**



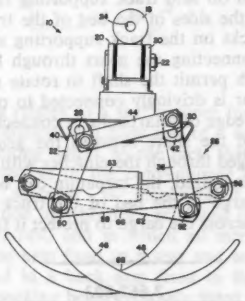
A device which may be attached to existing doors of a residence to safeguard against unwarranted intrusion while the occupants are sleeping or when answering a knock at the door, i.e., the device must be actuated by a person within the residence. The device includes a substantially indestructible tempered steel bar which bridges the crack of a door that is ajar. The bar is suspended from a pair of short chains which are inaccessible from the exterior side of the door. The free end of one of the chains is attached to a wedge which is removably received by a peculiar tamperproof receptacle. The receptacle is attached to a wraparound plate that is suitably fitted to the door panel by utilizing the existing door knob hardware to aid in the attachment thereof and for more positive reinforcement. The other chain has the opposite end attached to structure which is anchored into existing adjacent stud structure, i.e., 2" x 4" lumber or the like, so that the wall and/or the door panel would splinter before the device would become disengaged from either the wall or the door panel, irrespective of the amount of force being exerted from without. The door may be opened slightly to greet callers or guests while the device is engaged with absolute assurance that unwarranted intruders cannot break in, i.e., through the partially opened door.

3,667,795
RELEASING AND CIRCULATING OVERSHOT
Claude W. Gray, % OK Fishing and Rental Tools, Inc., P.O. Box 10131, Houma, La. 70360
Filed Dec. 8, 1970, Ser. No. 96,180
Int. Cl. E21b *31/02*
U.S. Cl. 294—86.17 9 Claims



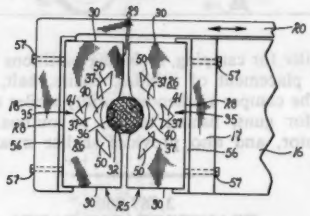
A releasing and circulating overshot with basket grapple and provided with a control spring operable, upon rotation of the overshot bowl, to urge the grapple basket into and out of contracted frictional engagement with an associated fish. The control spring is of the helical compression type and serves to maintain the basket grapple and bowl in relatively axially displaced positions with the basket grapple in its uppermost expanded "release" position while the overshot is being pulled upward past tool collars or tool joints without actuation of the basket grapple to catch the collars or tool joints. The spring also serves to allow the grapple to be set, when desired, merely by rotation of the bowl relative to the basket grapple.

3,667,796
LOGGING GRAPPLE
Welker W. Funk, Selma, Calif., assignor to Deere & Company, Moline, Ill.
Filed Oct. 30, 1970, Ser. No. 85,367
Int. Cl. B66c *1/10*
U.S. Cl. 294—88 16 Claims



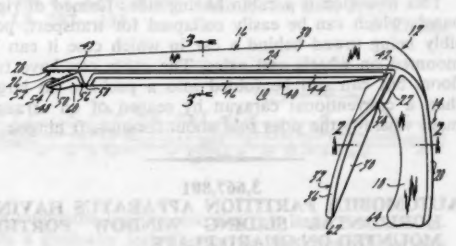
A pair of opposed arcuate tongs of a logging grapple are respectively pivoted to a pair of links, which are, in turn, pivoted to a yoke. A rotary fluid motor is supported on the yoke and is connected thereto to rotate the same through 360°. A hydraulic actuator has opposite ends pivotally connected to the tongs. Interconnecting the pair of links is a first cross-connected link and interconnecting the tongs are second and third cross-connected links, which respectively cause the pair of links and the tongs to move symmetrically upon extension and retraction of the hydraulic actuator. The various pivot points are selected such that the second and third cross-connected links cooperate with the tongs to grip logs when the actuator is extended. Also, the tong and linkage arrangement is designed so as to make it possible to pick up large bundles of logs as well as single small logs.

3,667,797
CUSHIONING DEVICE
Edward D. Kilby, Rte. 2, Box 413, Gridley, Calif. 95948
Filed Jan. 13, 1971, Ser. No. 106,057
Int. Cl. B25b *11/00*
U.S. Cl. 294—103 R 12 Claims



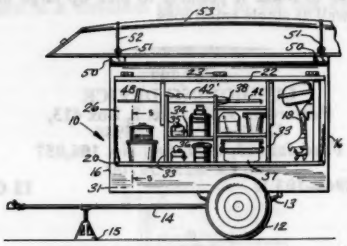
A cushioning device for the clamping jaws of a tree shaker or the like providing a substantially solid, relatively hard pad of somewhat compressible material adapted to be mounted on the jaws having an outwardly disposed tree gripping surface and means within the pad inwardly spaced from the gripping surface providing a readily compressible pocket to permit limited inward deformation of the gripping surface of the pad in intimately conforming, tightly gripping relation to a tree trunk or limb with only a minimum of jaw clamping pressure while transmitting substantially the entire shaking force from the shaker to the tree.

3,667,798
GRIPPING TOOL
John W. Rusztowicz, P.O. Box 116, Utica, Mich. 48087
Filed Feb. 27, 1970, Ser. No. 15,065
Int. Cl. B25b *7/00, 7/12*
U.S. Cl. 294—104 3 Claims



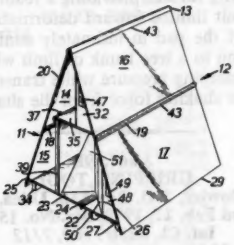
A gripping tool having a frame including an extending member with a jaw portion at one end and a handle at the other end, a bell crank connected to the extension adjacent the jaw portion having a cooperating jaw portion thereon, an actuating lever pivotally connected to the handle, and a linkage connecting the actuating lever and the bell crank for closing the jaw member. The parts of the gripping tool are integrally formed with resilient pivotal connections to reopen the jaws after each closing therof. The gripping tool is particularly suitable for use as a disgorger of fish hooks and lures.

3,667,799
CAMPER KITCHEN AND UTILITY TRAILER
Robert Stanley Shryock, 43 E. Guada Coma Drive, New Braunfels, Tex. 78130
Filed Apr. 20, 1971, Ser. No. 135,660
Int. Cl. B60p 3/32
U.S. Cl. 296—23 B 4 Claims



A trailer for camping, including partitions and shelving for the placement of utilities, chairs, bait, a sink and stove. The camper kitchen and utility trailer also provides means for guns, fishing tackle, an outboard motor, a refrigerator, and also provides shelter means.

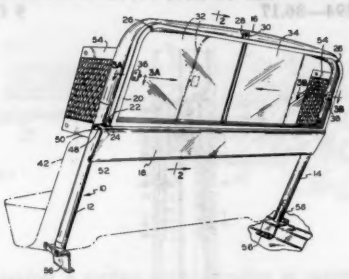
3,667,800
TRANSPORTABLE CABIN
James D. R. Cuthbert, 1 The Glade, Welwyn Garden, England
Filed Oct. 24, 1969, Ser. No. 869,296
Claims priority, application Great Britain, Oct. 25, 1968, 50,790/68
Int. Cl. B60p 3/34
U.S. Cl. 296—23 G 15 Claims



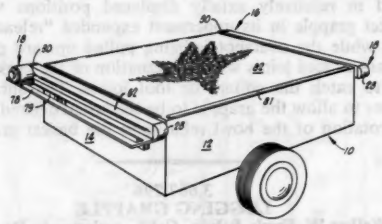
This invention is a cabin having sides formed of rigid panels which can be easily collapsed for transport, possibly being towed behind a car in which case it can be mounted on wheels and axles. The cabin can have two floors but can still be folded into a package no larger than a conventional caravan by reason of an arrangement whereby the sides fold about for-and-aft hinges.

3,667,801
AUTOMOBILE PARTITION APPARATUS HAVING HORIZONTAL SLIDING WINDOW PORTION MOUNTED ON GUARD PLATE
John R. Setina, Rte. 5, P.O. Box 522, Olympia, Wash. 98501
Continuation-in-part of application Ser. No. 758,947, Sept. 11, 1968. This application Dec. 18, 1969, Ser. No. 886,083
Int. Cl. B62d 33/04
U.S. Cl. 296—24 R 10 Claims

An automobile partition apparatus is described in which a pair of horizontal sliding partition window portions are mounted on the top of a guard plate extending across the entire width of the automobile adjacent the top of the front seat backrest. The guard plate extends parallel partly down the rear of the front seat backrest to enable such seat to be positioned at different heights. The guard plate and the partition frame are attached between the legs of a roll bar. Locks are provided for locking the partition windows closed which may be unlocked only from the front seat of the automobile. A window guideway is formed integral with the partition frame, including a pair of channels separated by a spacer which allows the two partition windows to to slide across each other in such channels without contacting.



3,667,802
COVERING STRUCTURE FOR VEHICLES
Charles E. Love, 4517 SE. 31st, Del City, Okla. 73115
Filed Feb. 18, 1971, Ser. No. 116,421
Int. Cl. B60j 11/00
U.S. Cl. 296—98 16 Claims

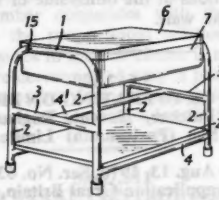


A covering structure for extending a tarpaulin over the cargo carried in a truck or trailer, including a pair of track supporting frames mounted for vertical movement on opposite sides of the bed of the truck, a pair of gear tracks mounted on said track supporting frames and extending along the sides of the bed of the truck, gears engaging the tracks on the track supporting structures, and a shaft interconnecting the gears through friction clutch elements which permit the shaft to rotate relative to the gears. A motor is drivingly connected to one end of the shaft and one edge of a tarpaulin is connected to the central portion of the shaft between the gears. When the gears are engaged through the clutches with the shaft, and the motor is energized, the tarpaulin can be rolled up to uncover the cargo in the bed of the truck or rolled out and extended across the cargo to protect it from inclement weather.

3,667,803
CONVERTIBLE FURNITURE
Edward J. Ford, 33 Mulberry Crescent, West Brayton, England
Filed Oct. 31, 1969, Ser. No. 873,004
Claims priority, application Great Britain, Nov. 22, 1968, 5,470/68
Int. Cl. A47b 85/04; A47c 7/50, 27/00
U.S. Cl. 297—119 2 Claims

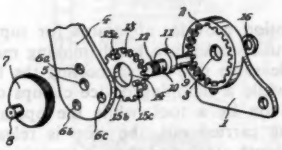
A piece of furniture comprises a support portion and an upper portion that includes a table top and a cushion arranged back-to-back, the upper portion being pivotally

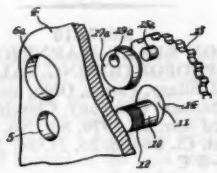
mounted on the support portion so that the article can be converted from a table to a leg rest and vice versa by turning the upper portion so as to bring the table top or



cushion uppermost as required. Means are provided for locking the upper portion to the support portion when the article is to be used as a table.

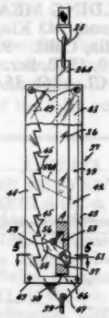
3,667,804
SEAT RECLINER
Hideaki Yasui, 2–6–12 Nishi-rokugoo, Ota-ku, Tokyo, Japan, and Sukeo Tsurumi, 62–574 Niina, Mino, Osaka-fu, Japan
Filed May 27, 1970, Ser. No. 40,871
Claims priority, application Japan, June 25 ,1969, 44/59,553
Int. Cl. A47c *1/024*
U.S. Cl. 297—362 **1 Claim**





This invention relates to a seat recliner for controlling an angle of reclination of a back-rest of a seat, which is characterized, among others, by the facts that no controlling spring is used as in the conventional devices, and that a shock absorber is incorporated so as to prevent propagation of vibrations produced in the chassis floor to the back-rest, and in which an internal gear is carried on a base arm fixed to a seat and several round holes are formed in a back arm fixed to the back-rest, with a resilient packing being rotatably fitted into each of said holes, and an external gear with teeth less in number than said internal gear is coupled to and supported by said resilient packings through swingable pins. Said external gear is meshed with said internal gear, and in the center hole of said external gear is fitted a cam provided on a cam shaft, the latter carrying at its end a grip. In accordance with rotation of said grip, the external gear is also rotated in meshed relation with the internal gear through the cam, and in response to this rotating motion of the external gear, said swingable pins are swung along a constant locus within the respective round holes through the resilient packings to thereby transmit the movement of said external gear to the back arm, so as to impart an inclination to the back arm corresponding to the gear ratio between the internal gear and the external gear.

3,667,805
LIMITED MOTION DEVICE FOR SHOULDER HARNESSES AND THE LIKE
Edward W. Apri, 998 Lehigh St., Altadena, Calif. 91001
Filed Apr. 30, 1970, Ser. No. 33,188
Int. Cl. A62b *35/60*
U.S. Cl. 297—385 **8 Claims**



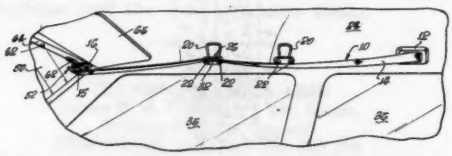
A motion restraining device in which a slider carrying an acceleration sensitive detent is movable in an anchored track that has detent arrestors along the path of the slider. The slider has a pin which extends through a slot in the detent. The slot is oriented such that slow motion of the restraining device is permitted, while fast acceleration results in a force on the slot by the pin to displace the detent into engagement with the detent arrestors.

3,667,806
AUTOMATIC LOCKING RESTRAINT BELT LINEAR RETRACTOR
Raymond G. Sprecher, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 3, 1970, Ser. No. 69,363
Int. Cl. A47c *31/00*; A62b *35/00*; B60r *21/10*
U.S. Cl. 297—388 **5 Claims**

An automatic locking restraint belt linear retractor includes a generally fork-like carrier that has a base with spaced pawl legs extending therefrom and spring biased toward the base wall of the retractor housing. Movement of the free end of a restraint belt outwardly of the housing moves the belt from a fully stowed position within the housing and concomitant therewith moves the carrier from a fully retracted position toward a successive series of extended positions. During movement of the carrier to the first extended position of the series from an intermediate position slightly retracted therefrom, the spring bias causes the pawl legs to engage and move respective blocking members from unblocked positions to blocked positions in which the blocking members block engagement of the pawl legs and linear ratchet walls of

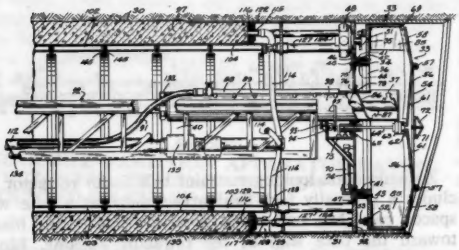
a channel-shaped linear ratchet member mounted on the base wall. With the blocking members in blocked positions, the carrier is thus free to move to any extended position of the series and upon the initial retracting movement therefrom, the pawl legs engage and move the blocking members to unblocked positions to allow engagement of the pawl legs and the ratchet walls whereupon a subsequent outwardly applied belt force pivots the base of the carrier into engagement with the cover wall of the housing to hold the carrier from further extending movement and the free end of the belt from corresponding movement outwardly of the housing.

3,667,807
SHOULDER BELT RELEASABLE HOLDING MEANS
Jacob E. Beeson, 943 Kingsley Drive, Arcadia, Calif. 91006
Filed Apr. 10, 1970, Ser. No. 27,382
Int. Cl. A26b *35/00*
U.S. Cl. 297—389 **6 Claims**



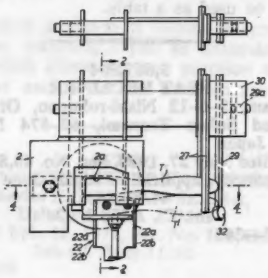
An automobile shoulder belt releasable holding means including retainer means mounted adjacent the windshield of a vehicle for releasably retaining the tongue end of said belt and maintaining the belt in a fully extended position of non-use ready for immediate release and use.

3,667,808
TUNNELING MACHINE WITH TANDEM SPOIL BARRIERS
John R. Tabor, Racine, Wis., assignor to Mining Equipment Manufacturing Corporation, Racine, Wis.
Original application July 9, 1968, Ser. No. 743,363, now Patent No. 3,561,223, dated Feb. 9, 1971. Divided and this application Feb. 24, 1970, Ser. No. 16,993
Int. Cl. E01q *3/03*
U.S. Cl. 299—33 **7 Claims**



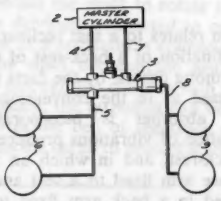
A tunneling machine for excavating through relatively muck earth strata generating fluid spoil, said machine having a shield with a fixed substantially closed bulkhead and an excavating wheel ahead of the bulkhead, said wheel having a face which can be substantially completely closed to breast fluid spoil, whereby two spoil barriers in tandem resist flow of fluid spoil. The wheel has a substantially closed front face with radially elongated openings, transversely extending pintles spanning said openings at a point intermediate the radial extent thereof and gates swingable on said pintles to selectively mucky earth strata generating fluid spoil, said machine side of the pintle moving outwardly beyond the front wall as gate portions at the other side of the pintle move inwardly of said wall.

3,667,809
APPARATUS FOR OPERATING ON BRUSH STOCKS
Harold Henry Fulcher, Havent, England, assignor to J. Evans & Son (Portsmouth) Limited, Portsmouth, England
Filed Aug. 13, 1970, Ser. No. 63,497
Claims priority, application Great Britain, Aug. 25, 1969, 42,274/69
Int. Cl. B25b *1/20*
U.S. Cl. 300—11 **9 Claims**



The invention provides apparatus for supporting and clamping brush stocks in a brush making machine comprising a releasable stop for supporting the brush stocks in a guide while a clamping device clamps one stock to be operated on by a tool, while the operation by the tool is being carried out, the stop is released to discharge one brush stock and then is repositioned to again support the brush stocks.

3,667,810
COMBINATION BRAKE WARNING SWITCH AND PROPORTIONING VALVE
Richard J. Silagy, Parma, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio
Filed Apr. 22, 1970, Ser. No. 30,887
Int. Cl. B60t *8/26, 11/34, 17/22*
U.S. Cl. 303—6 C **6 Claims**



A combination brake warning switch and proportioning valve includes a housing having an axial bore within which is located a switch piston and a proportioning piston at opposite ends of the bore. Fluid from two circuits of a dual brake system master cylinder is introduced to the bore on opposite sides of the switch piston which performs a switch actuating function in case of a pressure unbalance. The proportioning valve piston cooperates with a valve seat member slidably carried on the end of the switch piston to reduce the outlet pressure in one circuit

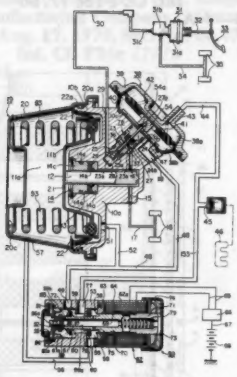
when the inlet pressure exceeds a predetermined level. In the event of failure of the other circuit, movement of the switch piston moves the valve seat member away from the proportioning piston which is then inoperable. When the proportioning valve is operative, the movable valve seat member cooperates with the proportioning piston so that the proportional relation between inlet and outlet pressures in the one circuit is maintained when the pressures are decreasing. A stop is provided to prevent the valve seat member from engaging the proportioning piston in the event of a pressure loss in the one circuit.

3,667,811

ANTISKID BRAKE CONTROL MECHANISM

Tosiaki Okamoto and Masami Inada, Kariya-shi, Japan, assignors to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan

Filed Mar. 5, 1970, Ser. No. 16,885
Claims priority, application Japan, Mar. 8, 1969, 44/20,818; Apr. 5, 1969, 44/31,002
Int. Cl. B60t *8/04*
U.S. Cl. 303—21 F **5 Claims**



An antiskid brake pressure control mechanism being provided with a first and second pneumatically operated servo assembly, the first servo assembly comprising a diaphragm piston which is urged by a first spring for normally opening a valve in a hydraulic brake apply circuit adapted for on-off control of the fluid communication between the master cylinder and preferred wheel cylinder assemblies, with both being provided in the hydraulic brake system to be controlled by a change-off valve actuated by a skid sensor, and second servo assembly comprising a diaphraghm piston urged by a second spring and adapted for actuating a plunger upon the operation of said first servo assembly for increasing or decreasing as the case may be, the effective volume of said hydraulic brake circuit part leading to said preferred wheel cylinder assemblies for decreasing or increasing the hydraulic brake pressure prevailing therein.

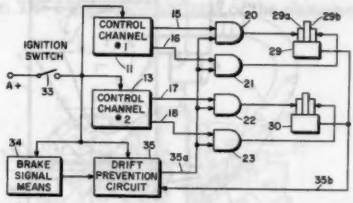
3,667,812

SKID CONTROL SYSTEM CYCLING AND CHECKING CIRCUIT, INCLUDING DRIFT PREVENTION MEANS

Ralph W. Carp, Baltimore, and Frederick O. Miesterfeld, Joppa, Md., assignors to The Bendix Corporation

Filed Dec. 7, 1970, Ser. No. 95,650
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 AF **17 Claims**

A skid control system includes at least a single control channel and a brake pressure modulating valve. Initial actuation of the system causes a temporary and false control signal to be generated due to initial charging of the control elements. This false control signal is applied to the



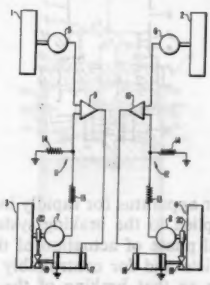
brake modulator to exercise the modulator. Any movement of the modulator interior parts is sensed by a switch and immediately acts through a drift prevention circuit to extinguish the effect of the false control signal.

3,667,813

INSTALLATION FOR PREVENTING SPINNING OF THE DRIVEN WHEELS OF A MOTOR VEHICLE

Manfred H. Burckhardt, Waiblingen, Hans-Jorg Florus, Goppingen, and Horst Grossner, Geradstetten, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 31, 1969, Ser. No. 872,892
Claims priority, application Germany, Nov. 2, 1968, P 18 06 671.2
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 EB **18 Claims**



An installation for preventing the spinning of the driven wheels of a motor vehicle in which the rotational slippage between the driven and non-driven wheels is determined, and in which the rotational speed of the driven wheels is controlled in dependence on the magnitude of such slippage.

3,667,814

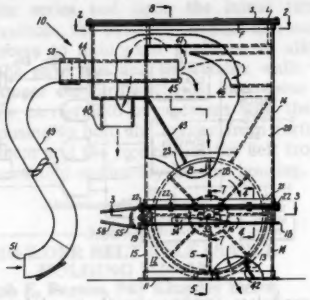
VACUUM LOADER

Alfred Krivda, P.O. Box 1055, Oroville, Calif. 95965

Filed Sept. 4, 1970, Ser. No. 69,602
Int. Cl. B65g *53/24, 53/40, 53/60*
U.S. Cl. 302—59 **1 Claim**

A vacuum loading apparatus for transferring dry particulate material from a storage point to a point of use or to a transport vehicle. The loader includes a pocketed wheel which is sealed against escape of air through the pockets or around the wheel. The pocketed wheel is rotated so that material drops into a pocket at the upper side of the wheel and is delivered through a discharge opening at the lower side of the wheel. A system including

a flexible hose delivers the dry material to a hopper overlying the pocketed wheel. The air flow passes through a



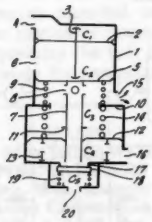
filter above the hopper and then to a suction fan to provide the power.

3,667,815

SERVO DISTRIBUTORS IN PNEUMATIC BRAKING SYSTEMS OF VEHICLES WITH TRAILER

Bruno Zoppi, Milan, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy

Filed Oct. 23, 1969, Ser. No. 868,861
Claims priority, application Italy, May 2, 1969, 16,306/69
Int. Cl. B60t *13/28*
U.S. Cl. 303—7 4 Claims



Servo distributor apparatus for rapidly increasing pneumatic pressure applied to the braking system of a towed vehicle upon initial phase of actuation of the brake pedal of the towing vehicle and for controllably increasing the pressure thereafter so that braking of the towed vehicle will occur either before or simultaneously with the braking of the towing vehicle.

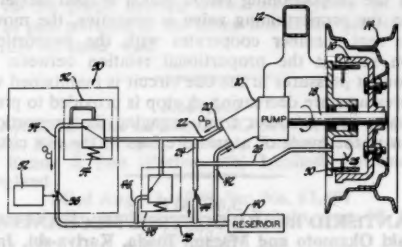
3,667,816

VEHICLE WHEEL VELOCITY CONTROL SYSTEM AND METHOD

John L. Harned, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1970, Ser. No. 11,512
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F 9 Claims

A vehicle brake system in which the wheel to be braked drives a positive displacement pump, the output fluid of which passes through a viscous orifice and also through a variable orifice in parallel flow relationship to the viscous orifice. The variable orifice is controlled to generate a pressure from the pump output through which the wheel brake is applied. A pressure reducing valve and a pressure relief valve are also provided. A modified system further uses a vehicle deceleration sensing mechanism to control the rate of wheel deceleration so that wheel deceleration is slightly greater than the synchronized deceleration obtained by control pressure feedback. The pump may be driven directly by the wheel or through a speed selector device having wheel and vehicle engine input drives, the selector



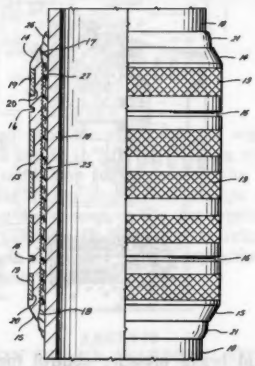
device selecting the higher of the two input speeds for the pump drive.

3,667,817

DRILL PIPE WITH WEAR SLEEVE

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed May 21, 1970, Ser. No. 39,430
Int. Cl. F16c *17/00*
U.S. Cl. 308—4 A 4 Claims



A metal drill pipe is provided with a metal wear sleeve and a fabric reinforced flexible, adhesive, plastics material insert between the wear sleeve and the pipe. The insert is built up on the pipe by applying alternate layers of liquid, uncured plastics material and fabric. The sleeve is made in sections which are clamped around the insert. The insert is then cured and thereafter the sleeve sections are welded together. The sleeve is mechanically interlocked to the insert, e.g. by a thread on the inside of the sleeve. The ends of the sleeve are internally flared to increase their flexibility and further increase in flexibility is afforded by annular grooves in the outer periphery of the sleeve adjacent the internally flared end portions. The grooves also serve as wear indicators.

3,667,818

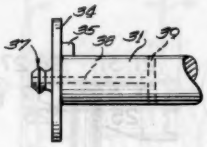
HEAVY DUTY CASTER AXLE AND INTEGRAL FITTING

Vincent Wallace Adamski and Ernest Beatty Moore, Greenville, Miss., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Oct. 19, 1970, Ser. No. 81,644
Int. Cl. F16c *1/24*
U.S. Cl. 308—92 4 Claims

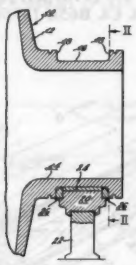
A heavy duty caster axle having an integral grease fitting formed at one end protected by a radially and forwardly extending annular flange which substantially encompasses the grease fitting. An axial passage is formed

through the grease fitting and extends into the axle to terminate in a diametrically extending passage opening to the exterior surface thereof. The axle and fitting are formed from a cylindrical blank by the steps of forming an enlarged radial flange spaced from one end of the



blank, forming the end of the blank at the flange to provide the outline of the fitting, drilling an axial passage into the formed end and shank and a transverse passage, and either forming the flange into a protective cup or attaching a protective cup onto the fitting end and flange.

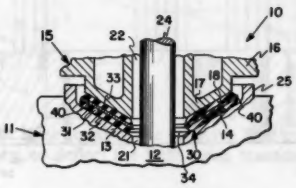
3,667,819
THRUST BEARING AND MOUNTING ARRANGEMENT THEREFOR
Raymond C. Jenness, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Aug. 17, 1970, Ser. No. 64,473
Int. Cl. F16c *17/10*
U.S. Cl. 308—135 **11 Claims**



A thrust shoe and mounting arrangement therefor particularly suitable for use as the thrust bearing for the trunnion of a rotary grinding mill or the like, in which the thrust shoe is provided with a wedgelike projection which is received in a correspondingly-shaped wedge-shaped recess machined in the end wall of the bearing insert of the upwardly open main bearing for the trunnion. The projection on the thrust shoe and the recess in which it is received typically might extend through a peripheral angle of 120 degrees. A detachable retainer member or clamp overlies the thrust shoe at each of the circumferentially spaced opposite ends thereof, to normally prevent movement of the thrust shoe relative to the bearing insert both in a circumferential as well as axial direction. The end retainer members may be removed to permit the thrust shoe to be slidably moved along the main bearing insert in a circumferential direction until the thrust shoe is free of the bearing insert, thereby permitting removal and replacement of the thrust shoe.

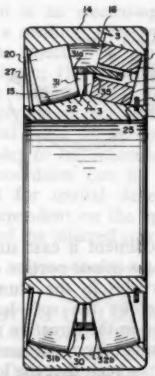
3,667,820
RAILWAY CAR HAVING RESILIENT CENTER BEARING
James W. Sherrick, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.
Filed Dec. 11, 1970, Ser. No. 97,217
Int. Cl. F16o *17/10*; B61f *5/16*
U.S. Cl. 308—137 **5 Claims**

In a railway car having truck and car body center plates disposed in telescoping relation, preferably defining nested conical opposed load carrying surfaces, a unitary resilient bearing in the form of an elastomeric body is disposed between the load carrying surfaces and cooperates therewith to carry both vertical and horizontal loads between the load carrying surfaces predominately in compression while carrying torsional or turning loads predominately in shear. The compressive stiffness of the elastomeric body



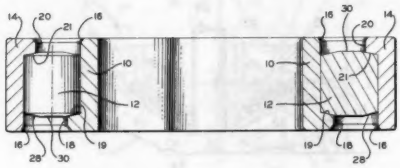
is substantially increased by the addition of a relatively nonextensible conical annular plate embedded in and bonded to the elastomeric body intermediate the load carrying surfaces without substantially affecting the shear stiffness of the body in accommodating relative angular movement between the center plates.

3,667,821
GUIDANCE AND RETENTION CAGE FOR SPHERICAL ROLLER BEARING
James A. Rader, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.
Filed Nov. 4, 1970, Ser. No. 86,790
Int. Cl. F16c *25/08*
U.S. Cl. 308—212 **13 Claims**



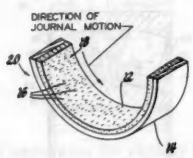
A cage device for a spherical roller bearing includes an annular ring which is positioned at one outboard axial end of the bearing or two such rings which are positioned between the rows of rolling elements in the raceway of a two-row spherical roller bearing. The annular rings have a plurality of pins or prongs extending axially outwardly therefrom. Each of the prongs extend into a bore in a respective roller. The cross-section of the prong is only slightly less than the diameter of the bore in the roller such that the prong and walls of the bore are in a close running fit in an operating installation. The prongs not only retain the rollers in the bearing raceway, but the close running fit between the prong and the bore also serves to guide the roller. In turn the rollers act to pilot the cage.

3,667,822
CONED END ROLLER BEARING
Jack W. Armstrong, Baldwinsville, N.Y., assignor to Lipe-Rollway Corporation
Filed Mar. 1, 1971, Ser. No. 119,482
Int. Cl. F16c *19/34*
U.S. Cl. 308—213 1 Claim



A radial type roller bearing having a relatively high axial load carrying capacity. The bearing rollers are formed with frusto-conical end faces which engage correspondingly tapered race flanges to take the thrust loads. The angle of the coned portion of the rollers is within a predetermined range that is the critical factor in obtaining the performance desired.

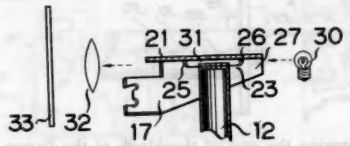
3,667,823
ALUMINUM BASED ALLOY BEARING
Fred J. Webbere, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.
Original application Oct. 29, 1968, Ser. No. 771,416, now Patent No. 3,562,884, dated Feb. 16, 1971. Divided and this application Aug. 10, 1970, Ser. No. 62,391
Int. Cl. F16c *33/12*
U.S. Cl. 308—237 6 Claims



In a preferred embodiment a cast strip of aluminum bearing alloy containing a minor portion of lead dispersed as small spherical particles in the aluminum matrix is rolled lengthwise, whereby the soft lead particles are flattened and lengthened in the direction of rolling. Sleeve bearing blanks are then cut from the cast and rolled strip in a direction and manner such that the longest dimension of the flattened lead particles in the finished bearing is transverse to the intended direction of rotation of a mating journal member.

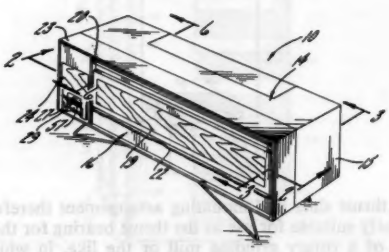
3,667,824
METHOD FOR ADJUSTING THE SPACE BETWEEN CATHODE AND FIRST PLATE GRID ELECTRODES IN AN ELECTRON GUN MEMBER
Asahide Tsuneta, Kawasaki, and Shinichi Sawagata, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Original application May 6, 1968, Ser. No. 726,765. Divided and this application Aug. 10, 1970, Ser. No. 62,594
Int. Cl. H01j *9/42, 9/44*
U.S. Cl. 316—23 3 Claims

In an electron gun member, a method for adjusting the space between the electron beam emitting surface plate of the cathode and a first plate grid electrode having a substantially annular protuberance thereon, comprising the steps of projecting light into a space formed between the cathode and first plate grid electrode through at least



one void area formed in part of the protuberance, presenting the resultant image of said space in an optically magnified form on a screen positioned outside of the electron gun member, and adjusting and determining the space while monitoring the optically magnified image.

3,667,825
APPARATUS FOR DISPENSING SHEET MATERIAL
Armin B. Pagel, Janesville, Wis., assignor to Newell Mfg. Co., Freeport, Ill.
Filed Dec. 17, 1970, Ser. No. 99,043
Int. Cl. B65h *19/00*
U.S. Cl. 312—39 8 Claims

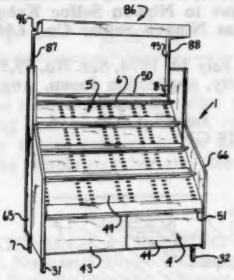


A material dispenser with an outlet formed by a door which is partially opened when the dispenser is operated to dispense sheets of material. In the dispenser, a web of material is squeezed between an idler roller and a drive roller to pull the web from a roll when a power source is activated to rotate the drive roller. When the door is fully opened to load a roll of material into the dispenser, a spring acts to yieldably catch against a linkage connected to the door to hold the latter in its fully opened position until a pressure is applied to the door to overcome the effect of the spring thereby allowing the door to be returned to its closed position.

3,667,826
MERCHANDISE DISPLAY UNIT
Gerald L. Wood, Overland Park, Kans., Harvey L. Kolster, Grain Valley, Mo., and James E. Zeller, Beatrice, Nebr., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.
Filed Nov. 20, 1970, Ser. No. 91,331
Int. Cl. A47f *3/14*
U.S. Cl. 312—118 6 Claims

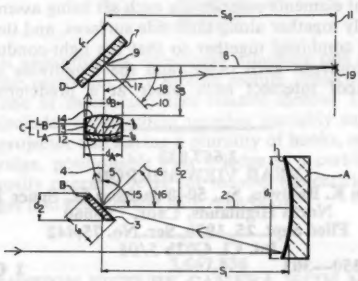
Units for displaying articles of merchandise are disclosed which each have knock-down back and base frames and a merchandise storage unit and merchandise display members for positioning articles of merchandise. Units

having adjustable shelves, rotary spinners, sloping display panel with shelves thereon, stepped compartments, and



vertically spaced bars with display members thereon are disclosed as exemplary of the inventive concept.

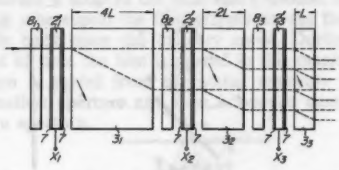
3,667,827
ASTRONOMICAL TELE-OBJECTIVE
Lawrence Monari, 1458 83rd St., Brooklyn, N.Y. 11228
Filed Mar. 16, 1971, Ser. No. 124,678
Int. Cl. G02b *17/00, 23/02*
U.S. Cl. 350—55 18 Claims



A tele-objective is presented in which the diffraction effects produced by the central obstruction affecting the image quality are very small. Plane and spherical optical surfaces are the only ones used. A relatively small positive achromatic doublet provides correction of aberrations of a concave spherical primary mirror. The tele-objective is compact and has a long effective focal length. The tele-objective can be used advantageously in a telescopic apparatus by the addition of a field lens.

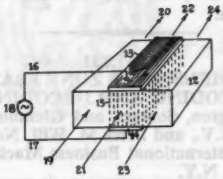
3,667,828
DIGITAL LIGHT DEFLECTOR
Hiroomi Kojima, Hachioji, Sadao Nomura, Tokyo, and Akio Kumada, Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed June 12, 1970, Ser. No. 45,835
Claims priority, application Japan, June 30, 1969, 44/51,608
Int. Cl. G02f *1/20*
U.S. Cl. 350—150 5 Claims

A digital light deflector comprising a cascade arrangements of *n* stages of a quarter-wave irregular ferroelectric crystal and a unit constituted by a uniaxial birefringent crystal cut at its opposite surfaces with a specified angle to an optic axis thereof and a quarter-wave plate, opposite *z* surfaces of said irregular ferroelectric crystal being provided with an electrical means for apply an elec-



tric field at least equal to the coercive field of said crystal, if necessary, to deflect the light being transmitted through said unit.

3,667,829
ELECTRO-OPTIC PHASE MODULATOR
Carl N. Klahr, 678 Cedar Lawn Ave., Lawrence, N.Y. 11559
Filed Mar. 30, 1970, Ser. No. 23,696
Int. Cl. G02f *1/28, 1/36*
U.S. Cl. 350—160 18 Claims

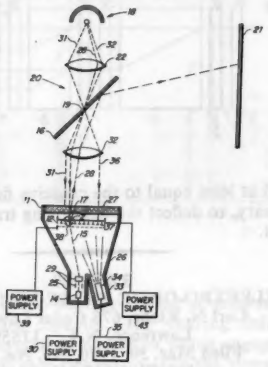


This invention is an electro-optical phase modulator comprising (a) a medium whose index of refraction can be varied by the injection of electric current following electrical breakdown; (b) appropriate electrodes for injection into the medium; (c) signal-controlled current sources for supplying current to the electrodes; and (d) a coherent optical beam whose optical path traverses the region whose index of refraction is varied by the injected current. This modulator can be used for direct phase modulation and for spatial deflection of the coherent optical beam, dependent on the spatial characteristics of the electrodes and the injected current.

3,667,830
DISPLAY SYSTEM UTILIZING A SELECTIVELY DEFORMABLE LIGHT-REFLECTING ELEMENT
Edmund H. Rottmiller, San Diego, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.
Filed Apr. 8, 1970, Ser. No. 26,687
Int. Cl. H01j *29/12*
U.S. Cl. 350—161 8 Claims

A large scale display system utilizing a deformable metal film light-reflecting surface or light valve is disclosed. A light valve is assembled consisting of a very thin metal film mounted on a support grid. An area of dielectric material is placed on the lower surface of the film within each grid opening. This assembly is placed in a cathode ray tube so that an electron beam may be caused to impinge upon the dielectric areas. In one embodiment, a conventional optical system is used to direct collimated light against the upper surface of the metal film. Light reflected from distorted portions of the metal film is transmitted to a display screen, while light reflected from undistorted portions of the metal film does not reach the screen. When the electron beam impinges upon the dielectric areas, the

areas are attracted by electrostatic attraction forces toward the adjacent grid members. This causes surface distortions or dimples in the metal film. A spot of light appears on the display screen at locations corresponding



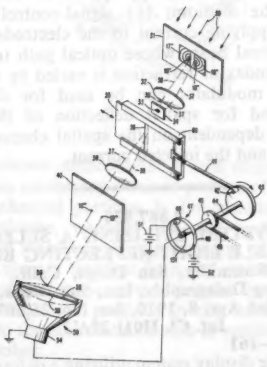
to the dimple locations. Where the dielectric areas are very small and closely spaced, an image corresponding to the areas scanned by the electron beam will appear on the display screen.

3,667,831

THREE-DIMENSIONAL ZONE PLATE GRID ENCODING AND DECODING

Keith S. Pennington, Somers, and Glenmore L. Shelton, Jr., Carmel, N.Y., and Peter M. Will, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,687
Int. Cl. G02b *27/38*
U.S. Cl. 350—162 SF **22 Claims**



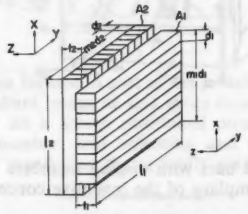
Depth of range information is extracted by projecting the image of a zone plate upon a scene and photographing the scene at a different angle from the zone plate source. A transparency of the photograph including zone plate modulation of the scene formed on planes in the scene is then filtered by a scanning slit at the zone plate focal plane and presented upon an output screen from end to end, as a function of original range, from the zone plate. The reflection of the image upon the screen in viewed in a varifocal mirror driven in synchronism with scanning by the filter. The screen and the varifocal mirror may be connected by a low-bandwidth, video channel and a channel for control signals for the mirror.

3,667,832

LIGHT-CONDUCTING STRUCTURE COMPRISING CROSSED LENTICULAR GRADIENT INDEX PLATES

Ichiro Kitano, Kobe, and Hiroyoshi Matsumura, Ashiya, Japan, assignors to Nippon Selfoc Kabushiki Kaisha (also known as Nippon Selfoc Co., Ltd.), Tokyo-to, Japan

Filed July 30, 1970, Ser. No. 59,577
Claims priority, application Japan, Aug. 4, 1969, 44/61,887
Int. Cl. G02b *5/14*
U.S. Cl. 350—175 GN **5 Claims**



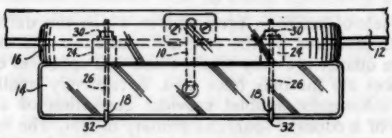
A light-conducting structure such as a multi-ocular lens or face plate comprising at least two sets of columinar transparent elements, each element having two side surfaces and two light-conducting surfaces, both extended in a plane parallel relation, the element having a Refractive Index distribution in a plane perpendicular to a center plane thereof varying in such a manner that the Refractive Index is gradually decreased proportionally to the second power of distance measured from the center plane, transparent elements constituting each set being assembled successively together along their side surfaces, and the two sets being combined together so that the light-conducting surfaces confront each other, and the lengthwise directions thereof intersect each other at a predetermined angle.

3,667,833

REAR VIEW MIRROR

William K. Baldwin, Sr., 5040 Jackson St., Space 22, North Highlands, Calif. 95660

Filed Sept. 25, 1970, Ser. No. 75,442
Int. Cl. G02b *5/08*
U.S. Cl. 350—303 **1 Claim**



A rear view mirror having a plane and a convex portion for viewing on both sides of the vehicle in addition to the rear thereof.

3,667,834

ADJUSTABLE LENGTH TEMPLE FOR SPECTACLES

Ellison L. Davison, Gibsonia, Carl H. Brinkhoff, Pittsburgh, and Robert F. Menold, Monroeville, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

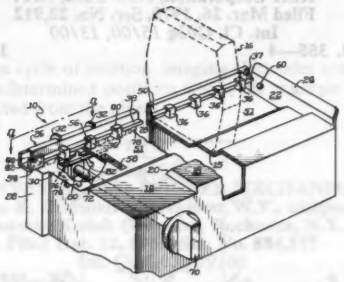
Continuation-in-part of application Ser. No. 16,374, Mar. 4, 1970. This application Mar. 22, 1971, Ser. No. 126,572
Int. Cl. G02c *5/20*
U.S. Cl. 351—118 **8 Claims**

A spectacles temple is formed from a front sleeve and a rear head-engageable temple member fitting snugly in the back end of the sleeve and slidable lengthwise in it.

The front end of the rear member is provided with a slot separating it into upper and lower spring prongs. One prong is provided with a laterally projecting boss pressed

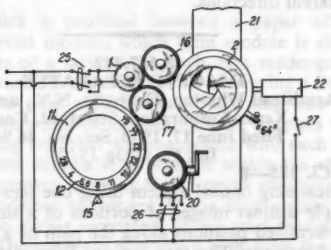
tightly against the sleeve, and the other prong is provided with a locking boss projecting into a recess in a row of longitudinally spaced recesses in the sleeve wall to normally lock the temple member and sleeve together.

3,667,835
FILM CARTRIDGE ATTACHING APPARATUS
Arthur E. Nupnau, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Apr. 15, 1970, Ser. No. 28,829
Int. Cl. G03b *21/04*
U.S. Cl. 352—72 **8 Claims**



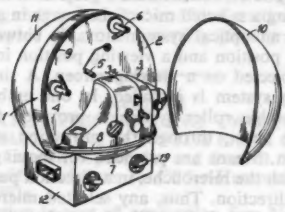
An apparatus for selectively attaching one or a group of film cartridges to a motion picture projector for moving one or more cartridges relative thereto. The apparatus includes an attaching member movably supported on the projector and having a plurality of hooks, one for each cartridge, positionable over a ledge in a cartridge, and a manually operable lever for moving the cartridge or cartridges into engagement with each hook.

3,667,836
MOTION PICTURE CAMERA WITH MEANS PRODUCING A DISSOLVING EFFECT
Heinz Thiele, Leinfelden, near Stuttgart, and Konrad Franke and Dietrich Becker, Stuttgart-Mohringen, Germany, assignors to Zeiss Ikon Aktiengesellschaft, Stuttgart, Germany
Filed Apr. 16, 1970, Ser. No. 29,202
Claims priority, application Germany, Apr. 22, 1969, P 19 20 438.7
Int. Cl. G03b *19/18*
U.S. Cl. 352—91 **3 Claims**



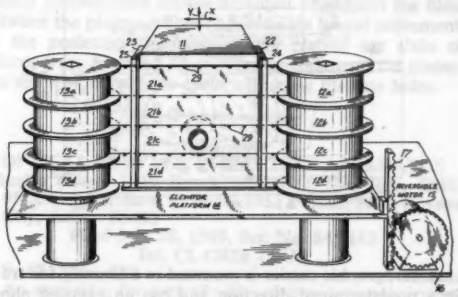
A motion picture camera with a motor operated diaphragm and suitable for producing a dissolving or fading effect at the end of a scene photographed. Separate motors are provided for the film moving gripper and the film wind-up spindle, which latter is equipped with a nonreversing lock. During the dissolving procedure the film gripper moves the film forwardly a predetermined length while the wind-up spindle is stopped, so that this length of film forms a loop in the film space around the wind-up spindle whereupon the film gripper moves the film rearwardly back upon the delivery spool. During the same period of time the film is moved in this manner, the diaphragm is varied from the actual exposure aperture to its smallest aperture and then is opened again to its exposure aperture.

3,667,837
CINEMATOGRAPH PROJECTOR PARTICULARLY FOR SUBSTANDARD FILMS
Eugenio Agrati, Via A. da Baggio 20/5, and Ennio Sala, Via A. da Baggio 20/13, both of Milan, Italy
Filed June 8, 1970, Ser. No. 44,223
Claims priority, application Italy, Oct. 10, 1969, 23,199/69
Int. Cl. G01n *21/14*
U.S. Cl. 352—242 **1 Claim**



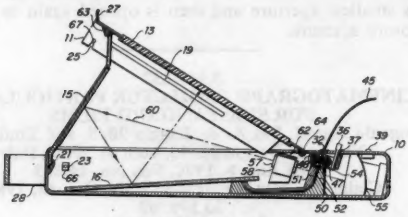
A cinematograph projector having a spherical upper casing slidably supported on a cradle-like support base and controlled by means of a rack and pinion arrangement.

3,667,838
UPDATABLE FILM APPARATUS FOR A MICROFILM RETRIEVAL SYSTEM
William Wadsworth Wood, 235 Peruvian Ave., Palm Beach, Fla. 33480
Filed Nov. 17, 1969, Ser. No. 877,266
Int. Cl. G03b *23/12*
U.S. Cl. 353—26 **3 Claims**



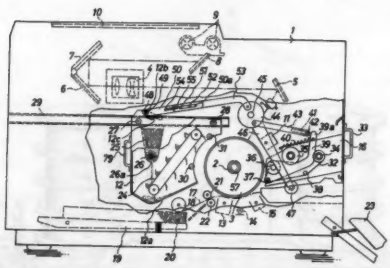
A plurality of reels coaxially positioned in adjacent relation are driven in synchronism with each other. Each of a plurality of strips of film is wound on a separate one of the reels so that any of the reels may be removed for updating without preventing the driving of the remainder of the reels.

3,667,839
MICROFICHE VIEWER
Maurice H. Artaud, Spring Valley, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.
Filed May 4, 1970, Ser. No. 34,199
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 **9 Claims**



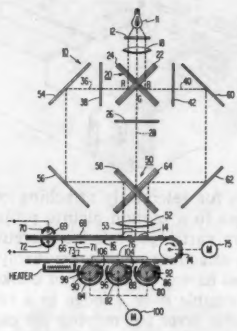
A compact portable projection viewer for microimages is disclosed. The viewer includes a projection lamp, means for positioning a selected microfiche image in a projection station, and an optical system movable between a compact storage position and a viewing position in which the image is projected on a viewing screen. A simple, effective focusing system is included. In one embodiment, a parallel rotatable roller system is provided for moving a microfiche sheet, through the projection station in a first direction. Means are provided for moving the roller assembly, with the microfiche, in a direction perpendicular to the first direction. Thus, any selected microimages on the sheet may be located at the projection station.

3,667,840
ELECTROPHOTOGRAPHIC COPIER WITH REMOVABLE DRUM
Herbert Engel, Munich, Karl Hartwig, Unterhaching, and Gunther Schnall, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Dec. 10, 1970, Ser. No. 96,939
Claims priority, application Germany, Dec. 10, 1969, P 19 61 836.1
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **10 Claims**



A xerographic carrier is mounted in a housing for travel in a predetermined direction and has an exposed photoconductive layer which is adapted to be uniformly charged in preparation for transfer of latent images to the layer. The carrier can be withdrawn from the housing in a predetermined path. It is usually a drum mounted on a stationary shaft in the housing. A developer device is mounted in the housing and can move substantially radially of the drum between a position engaging the drum for discharging onto the same electroscopic developer material which forms on the charged layer powder images, and a withdrawn position remote from the carrier. A cleaning device is also provided which can similarly be moved radially of the drum between a position engaging the latter and removing residual electroscopic developer material from the layer and a radially withdrawn position. A moving arrangement is provided for moving one or both of these devices between their respective positions. The moving arrangement includes a pivoting crank and a lever for pivoting it located adjacent to the accessible end of the drum. When the moving arrangement is in a location in which the one or both devices are in their operating positions, the lever will block withdrawal of the drum from the housing.

3,667,841
METHOD OF AND APPARATUS FOR REPRODUCING A COLORED IMAGE BY ELECTROPHOTOGRAPHIC MEANS
Donald Alexander Ross, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Mar. 26, 1970, Ser. No. 22,912
Int. Cl. G03g *15/00, 13/00*
U.S. Cl. 355—4 **10 Claims**

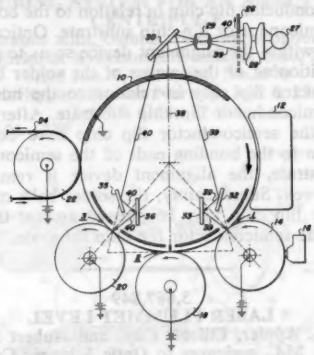


An electrophotographic recording element is exposed with three differently colored and differently oriented banded images in register. The resultant banded latent image of each of the color-banded images is developed selectively with a different toner of a complementary color for a subtractive process. The novel apparatus comprises dichroic reflectors and three differently oriented line screens for simultaneously projecting three illumination patterns of the colored image to be reproduced with lights of three primary colors. At least two rotatable screw-type toner applicators are provided for developing the bands of two of the color-banded images that slant in different directions.

3,667,842
IMAGING APPARATUS
Armistead Wharton, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed June 17, 1970, Ser. No. 46,948
Int. Cl. G03g *15/04*
U.S. Cl. 355—8 **12 Claims**

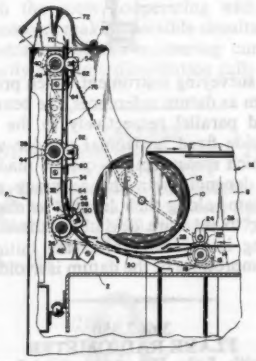
A scanning optical system using one lens that projects multiple distinct images of portions of a single object at predetermined positions along the path of a moving nonplanar receptor. The lens projects light rays that are divided by strategically placed reflecting surfaces. The input can be transparent or opaque and is projectable at various magnifications. Varying processing equipment is operatively placed along the path of the moving image receptor.

In a machine for automatically producing images from photoelectrophoretic suspensions using a cylindrical transparent image receptor which is exposed and re-exposed



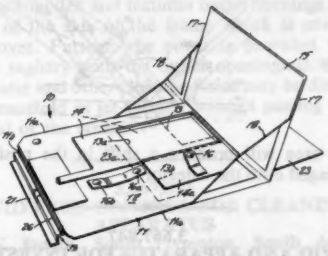
during one cycle of rotation, imaging electrodes are placed at the predetermined positions where the multiple images are projected from the object.

3,667,843
CONVEYOR AND PRINTER MECHANISM
George K. Czarnikow, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,577
Int. Cl. G03b *29/00*
U.S. Cl. 355—29 9 Claims



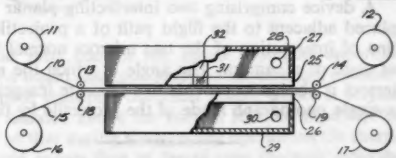
An interlock is provided between a paper advance roller on a print module, which print module is slidable into a chassis of a larger unit, such as a reader-printer, and a conveyor within the chassis for conveying a finished print from the print modulate to an exit slot. The interlock comprises a pair of similar rotatable couplers which have extending lugs that are engageable with each other when the print module is in position within the chassis. One of the couplers is spring-biased on its rotational axis to provide relative movement if the lugs engage each other head-on during movement of the print module into the chassis. The conveyor provides a path from the paper advance device to the exit slot and includes a fixed plate through which drive rollers extend and a removable plate parallel thereto through which pressure rollers extend which are spring-biased against the drive rollers.

3,667,844
MULTIPLE MASKING ATTACHMENT FOR PHOTO EASEL
Loyd W. Pittman, St. Louis, Mo., by Ruth Pittman, surviving spouse and heir of said Pittman, deceased
Filed Apr. 8, 1970, Ser. No. 26,663
Int. Cl. G03b *27/58*
U.S. Cl. 355—54 8 Claims



An attachment for a photo easel, the device comprising a unit incorporating a plurality of different sized windows so that the device may be used as a masking attachment for exposing only preselected confined portions of a sheet of photographic paper for printing photographic reproductions.

3,667,845
APPARATUS FOR HOLDING TWO FILMS IN INTIMATE CONTACT WITH EACH OTHER
Minard A. Leavitt, Sepulveda, and Poul B. Roulund, El Toro, Calif., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.
Continuation-in-part of application Ser. No. 27,690, Apr. 13, 1970. This application June 15, 1970, Ser. No. 46,430
Int. Cl. G03b *27/20*
U.S. Cl. 355—91 5 Claims

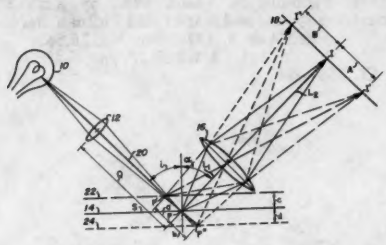


A contact printer has two closely spaced adjacent platens with dissimilar patterns of fluid passages. Fluid is forced through the passages to form between the platens and the adjacent film surfaces fluid cushions that hold the films in intimate contact with each other. The passages are sufficiently concentrated and so arranged to support the films between the platens without appreciable lateral movement. In the preferred embodiment, the platens are slabs of microporous material. In another embodiment, the platens are slabs of nonporous material having discrete holes.

3,667,846
OPTICAL SURFACE INSPECTION APPARATUS
Charles Nater, 1519 Brookvale Drive, San Jose, Calif. 95125, and Willard E. Buck, 1951 Poplar, Lake Havasu City, Ariz. 86403
Filed July 28, 1969, Ser. No. 845,163
Int. Cl. G01b *11/30*
U.S. Cl. 356—120 9 Claims

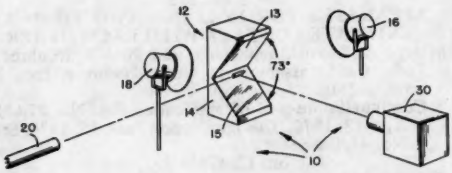
An apparatus for optically detecting microscopic irregularities or relative elevational variations in or of a material surface comprising a means for illuminating a microscopic area of the surface to be monitored or evaluated, an optical detector means which produces an output signal responsive to the position of a light spot cast thereupon, and an optical lens system for imaging the illuminated surface area onto the detector means. Preferably, both the illuminating means and the imaging lens system have their

optical axes angularly disposed relative to the work surface so that a change in the elevation of the illuminated



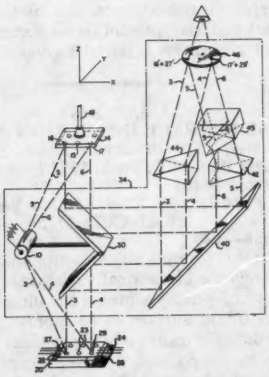
surface area will produce a shift in the position of the spot imaged onto the detector.

3,667,847
METHOD AND APPARATUS FOR INVESTIGATION OF PROJECTILE FLIGHT
William C. Griffin, Ridgecrest, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Aug. 24, 1970, Ser. No. 66,368
Int. Cl. G01b *19/34*
U.S. Cl. 356—138 1 Claim



A device comprising two intersecting planar mirrors is placed adjacent to the flight path of a projectile with the line of intersection of the two mirrors normal to the line of sight of a camera. The angle at which the mirrors intersect is chosen to provide five separate images visible in a single photograph made of the projectile by the camera.

3,667,848
SEMICONDUCTOR CHIP BONDING METHOD
John O. Percival, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Feb. 2, 1970, Ser. No. 7,648
Int. Cl. G01b *11/26*
U.S. Cl. 356—153 1 Claim

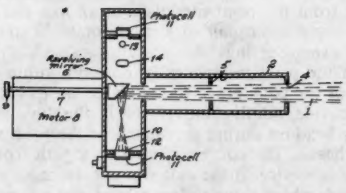


The present invention relates to a method and apparatus for aligning and bonding a semiconductor flip chip to a semiconductor flip chip substrate. An alignment device which has an approximately right-angle set of mirrors is inserted between the solder balls of the semiconductor flip chip and the bonding pads of the semiconductor flip chip substrate, so as to align the solder balls of the semiconductor flip chip in relation to the bonding pads of the semiconductor flip chip substrate. Optical means is provided within the alignment device so as to present the super-positioning of the images of the solder balls of the semiconductor flip chip in relation to the bonding pads of the semiconductor flip chip substrate. After the solder balls of the semiconductor flip chip have been aligned in relation to the bonding pads of the semiconductor flip chip substrate, the alignment device is removed from therebetween. Subsequently, the solder balls of the semiconductor flip chip may be pressed against the bonding pads of the semiconductor flip chip substrate.

3,667,849
LASER PLUMMET LEVEL
Robert L. Appler, Ellicott City, and Hubert H. Hoehn, Laurel, Md., assignors to Optic Sciences Corporation, Columbia, Md.
Filed Oct. 28, 1969, Ser. No. 871,922
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 5 Claims

A precision surveying instrument which projects orthogonal laser beam as datum references, the beams being perpendicular and parallel respectively to the local gravity vector to provide fixed horizontal and/or vertical references from which measurements can be made. Sensors of many forms, depending on the accuracy required, can probe these beams along their lengths to align a series of components or to measure deviations therefrom. No operator handling is necessary after the initial set-up and inadvertent compromise of the datum is avoided.

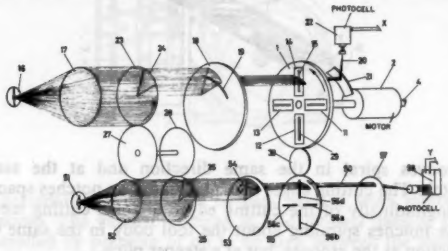
3,667,850
FLARE RADIOMETER
Chester L. Smith, Lake Hopatcong, and Louis R. Szabo, Landing, N.J., assignors to the United States of America as represented by the Secretary of the Army
Filed Nov. 23, 1970, Ser. No. 91,896
Int. Cl. G01j *3/50*
U.S. Cl. 356—186 5 Claims



A compact, inexpensive radiometer analyzes incoming light from a flare or other source and gives a rapid read-

out as to the output of the light source in all of the various bands and pass-bands of the spectrum.

3,667,851
MEASURING SYSTEM FOR AN ANALYTICAL CENTRIFUGE
Rasmus Strande Alm, Osteras, Norway, assignor to Norsk Hydro-Elektrist Kvaelstofaktieselskao, Oslo, Norway
Filed Jan. 6, 1970, Ser. No. 970
Claims priority, application Norway, Jan. 6, 1969, 39/69
Int. Cl. G01n *15/04*
U.S. Cl. 356—197 **10 Claims**

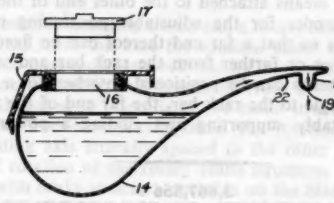


A measuring system for an analytical centrifuge having a rotor with two or more preferably swinging sedimentation cells to be scanned by light passage. The scanning means has a preferably adjustable and preferably curved optical slit through which the light passes to reach the rotor and traverses a radially extending slit located in front of each sedimentation cell. A cathode ray tube with a vertical deflection system has applied thereto signals generated by the light beam passing through the sedimentation cells. A synchronizing means causes the horizontal deflection in the cathode ray tube according to the light scanning of each separate cell during the rotation of the rotor. Trigger means has one or more members rotating with the rotor cooperating with one or more stationary members making possible simultaneous observation or registration of the measuring curve for two or more arbitrarily chosen sedimentation cells on the cathode ray tube.

3,667,852
CAR WASHING ASSEMBLY WITH PRESSURIZED WATER SUPPLY
Frank E. Mayden, Springfield, Ill., assignor of a fractional part interest to Theresa E. Mayden, Springfield, Ill.
Filed Oct. 1, 1970, Ser. No. 77,294
Int. Cl. A41l *13/23*
U.S. Cl. 401—263 **4 Claims**

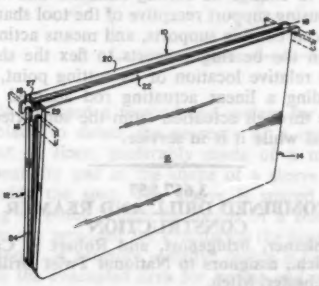
A fountain type wand defining a handle at one end and having a panel-like head at its other end of greater length than width and disposed transverse to the longitudinal axis of the wand. The head is mounted on the wand for oscillation about an axis extending transversely of the wand and generally paralleling the longitudinal center line of the head. An endwise outwardly opening U-shaped frame is supported from the end of the wand remote from the handle and the head is oscillatably supported between the free ends of the legs of the U-shaped frame. A soft cover is provided for the head and is constructed of a material through which fluids may pass and which is capable of retaining a given quantity of fluids in the manner of a sponge. The cover not only covers the head but also one side of the supporting frame and the head is in the form of a manifold to which cleaning fluids under pressure may be supplied and includes outlet openings opening outwardly of the side of the frame which is covered by the soft cover. Further, the cover is provided with an opening in registry with the outlet openings in the head whereby water and other cleaning fluids may be discharged from the manifold in jet fashion without passing through the material of the cover.

3,667,853
LIQUID FEED CONTROL FOR CLEANING APPARATUS
Donald N. Smyth, South Plympton, South Australia, Australia, assignor to S.A. Brush Company, Limited, Albert Park, South Australia, Australia
Original application Aug. 13, 1968, Ser. No. 752,284, now Patent No. 3,583,818, dated June 8, 1971. Divided and this application Oct. 28, 1970, Ser. No. 84,638
Claims priority, application Australia, Aug. 25, 1967, 26,399/67
Int. Cl. A46b *11/04*
U.S. Cl. 401—291 **4 Claims**



A liquid feed control for liquid shampoo apparatus wherein the liquid shampoo is fed to the cleaning members from a liquid shampoo container whose outlet is formed as a weir situated above the normal level of liquid in the container so that during shampooing operations the inertia of the liquid causes flow of liquid over the weir onto the cleaning members.

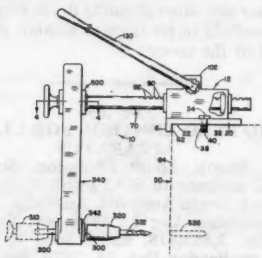
3,667,854
BINDER FOR A SUSPENSION FILE
Frank D. Jonas, Oyster Bay, N.Y., assignor to Oxford Pendaflex Corporation, Garden City, N.Y.
Filed Aug. 31, 1970, Ser. No. 68,321
Int. Cl. B42f *3/00, 15/00*
U.S. Cl. 402—17 **1 Claim**



A binder for retaining loose pages is adapted to be stored in a conventional suspension file when the binder is not in use. Hook shaped members project outwardly

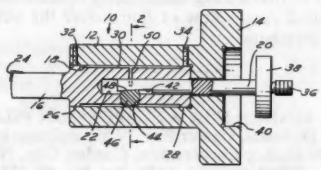
from the spine of each leaf of the binder for engaging parallelly extending suspension rails.

3,667,855
PORTABLE DRILL GUIDE
Allan O. Douglass, 5635 Kansas Ave. 68110, and Robert F. Douglass, 5708 Willit St. 68152, both of Omaha, Nebr.
Filed Sept. 29, 1970, Ser. No. 76,469
Int. Cl. B23b *45/14*
U.S. Cl. 408—114 **6 Claims**



A portable drill guide comprising attachment means adapted to be anchored to a work-piece and on which a hand lever control rack and pinion is mounted, an elongated frame means attached to the outer end of the rack bar in a manner for the adjustable positioning of the frame means so that a far end thereof can be fixed in a position closer or farther from the rack bar and so that the frame means can be positioned anywhere in a plane at a right angle to the rack bar, the far end of the frame means rotatably supporting and guiding a power drill assembly.

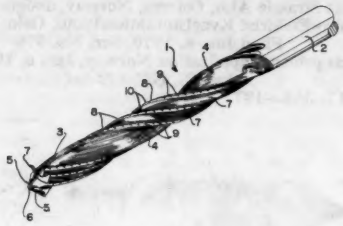
3,667,856
SMALL POINT RETRACTABLE BORING TOOL
Robert W. Walker, Detroit, Mich., assignor to The Valeron Corporation
Filed May 18, 1970, Ser. No. 38,152
Int. Cl. B23b *29/034*
U.S. Cl. 408—158 **9 Claims**



A boring tool with means for adjusting a single point boring bar to change its cutting diameter and which includes a housing support receptive of the tool shank therewithin, spaced bearing supports, and means acting on the bar between the bearing supports to flex the shank and change the relative location of its cutting point, particularly including a linear actuating rod adapted to effect the change through actuation from the supported end of the tool and while it is in service.

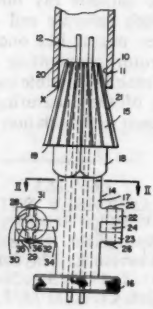
3,667,857
COMBINED DRILL AND REAMER CONSTRUCTION
Milo W. Shaner, Bridgeport, and Robert S. Cave, Bay City, Mich., assignors to National Twist Drill & Tool Co., Rochester, Mich.
Filed Oct. 30, 1970, Ser. No. 85,625
Int. Cl. B23b *51/08*
U.S. Cl. 408—230 **13 Claims**

A rotary cutting tool combining the characteristics of a drill and a reamer has a cylindrical body provided with spade-like drilling edges at one end thereof from which spiraling grooves extend toward the other end to provide helical cutting edges circumferentially spaced from one another by the grooves. Two diametrically opposed grooves are deeper than the remaining grooves, and all



grooves spiral in the same direction and at the same pitch. The cutting edges are interrupted by notches spaced longitudinally of the cutting edges to form cutting teeth, the notches spiraling about the tool body in the same direction as the grooves, but at a steeper pitch.

3,667,858
CONDUIT REAMING MEANS
Andrew Bain, 2440 Greenwich St., San Francisco, Calif. 94123
Filed Oct. 19, 1970, Ser. No. 81,659
Int. Cl. B23d *77/12*
U.S. Cl. 408—229 **10 Claims**

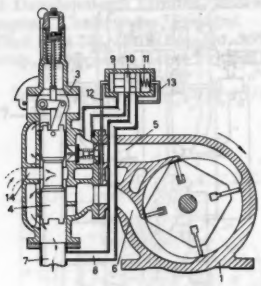


Means are provided for reaming out a hollow elongated conduit containing wires extending therethrough and out one end thereof. The means includes a housing having a hollow cavity and separable into two parts so that the wires can be placed along the cavity and the two parts locked together. The housing includes a conically-shaped reaming portion which is then extended into the conduit and the inner wall of the conduit can be reamed without removing the wires therefrom.

3,667,859
HYDRAULIC SYSTEMS
Inge Kore Dragsund and Erling M. Naas, Brattvag, Norway, assignors to A/S Hydraulik Brattvaag, Brattvag, Norway
Filed July 24, 1970, Ser. No. 58,083
Claims priority, application Norway, July 25, 1969, 3,076/69
Int. Cl. F04d *27/00*; F04b *49/00*
U.S. Cl. 415—148 **8 Claims**

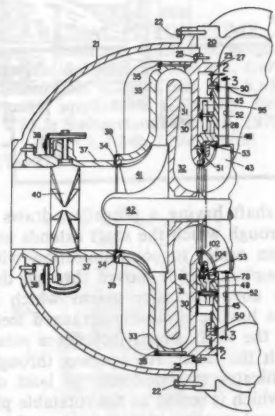
Hydraulic systems of the low pressure type which comprise a pump driving a motor, the working medium

supply and discharge of which is controlled by a hand-operated control valve, said systems being provided with



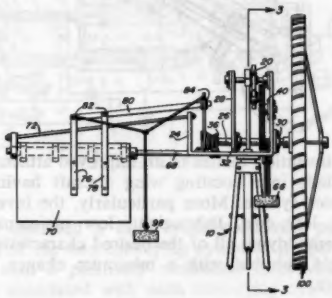
an automatically controlled by-pass passage from motor to pump. The passage opening in said by-pass passage is controlled by pressure of oil in an area between the slide of the control valve and the motor.

3,667,860
DIFFUSER VALVE MECHANISM FOR CENTRIFUGAL GAS COMPRESSOR
James W. Endress, Syracuse, Edson H. Byrns, Fayetteville, and Carl M. Anderson, Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 13, 1970, Ser. No. 19,200
Int. Cl. F04d *15/00, 27/00*
U.S. Cl. 415—150 **7 Claims**



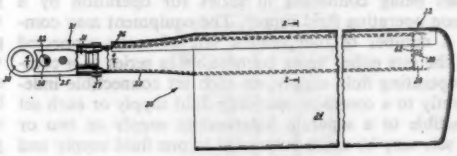
An annular support member is fixedly mounted concentrically of the impeller and has an annular surface forming one side wall of the diffuser passage. A sleeve valve is mounted at the bore of the support member for movement transversely of the diffuser passage. A valve actuating mechanism is carried by the support member and operable exteriorly of the machine casing for moving the valve transversely of the diffuser passage. The valve actuating mechanism includes a plurality of crankshafts journaled for rotation in the support. A drive shaft is provided to effect rotation of the crankshafts in unison, the drive shaft having an end portion extending exteriorly of the machine casing.

3,667,861
WIND VANE CONTROLLING DIRECTION AND BRAKE MEANS
Albert A. Parish, Earth, Tex., assignor to K.M.P. Lake Pump Mfg. Co., Earth, Tex.
Filed May 1, 1970, Ser. No. 33,590
Int. Cl. F03b *7/00*
U.S. Cl. 416—14 **2 Claims**



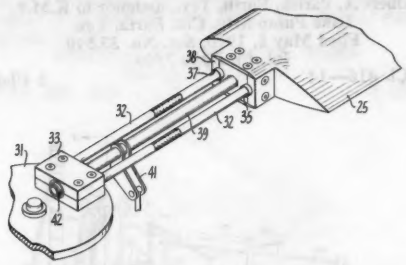
A windmill including a base and a rotary blade structure journalled from the base for rotation about a horizontal axis. The base includes a rearwardly displaced upstanding tail vane depending and journalled from a shaft paralleling and spaced to one side of the blade structure axis of rotation. The base is supported for rotation about an upstanding axis laterally spaced to the other side of the axis of rotation of the rotary blade structure, and is provided with brake structure operable on the blade structure and actuated by the tail vane upon swinging of the tail vane from a vertical position toward a horizontal position.

3,667,862
BLADE INSPECTION SYSTEM AND METHOD
Robert A. Parr, Linwood, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 9, 1970, Ser. No. 96,419
Int. Cl. B64c *27/46*
U.S. Cl. 416—61 **11 Claims**



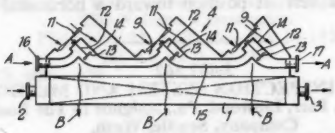
There is disclosed a method and system for inspecting a rotor blade to detect the presence of a crack in the blade spar. A liner, preferably made of a material of low permeability and in the shape of a sleeve or bag is placed inside the spar. The sleeve is spaced from the spar along its entire length by means of a bleeder cloth and means are provided for evacuating the area occupied by the bleeder. A pressure sensitive device is hermetically coupled to the evacuated area for testing and monitoring the pressure within that area. If a crack develops in the spar, air will enter the evacuated area resulting in a loss of vacuum which will be detected by the pressure sensitive device.

3,667,863
ROTOR HUB AND BLADE ATTACHMENTS
Gerald L. Breuner, 50 Melody Lane, Orinda, Calif. 94563
Filed Feb. 3, 1970, Ser. No. 8,232
Int. Cl. B64c *27/38*
U.S. Cl. 416—138 **8 Claims**



This invention relates to an improved attachment for a rotor blade in a rotating wing aircraft having a semi-rigid rotor system. More particularly, the invention provides a low cost, lightweight, low maintenance rotor system embodying all of the desired characteristics of the semi-rigid hub but with a minimum chance of fatigue or failure.

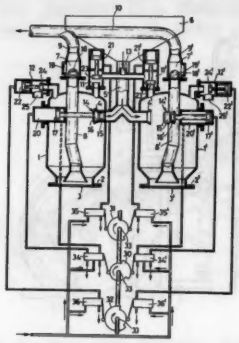
3,667,864
AIR- OR GAS-MOVING EQUIPMENT FOR USE WITH HEAT EXCHANGE AND/OR GAS-SCRUBBING APPARATUS
Edmund Murphy, La Spezia, Italy, assignor to Cooling Development Ltd., Lucerne, Switzerland
Filed May 7, 1970, Ser. No. 35,357
Claims priority, application Great Britain, May 14, 1969, 24,507/69
Int. Cl. F04b *17/00, 35/00;* **F24h** *3/02*
U.S. Cl. 417—53 **13 Claims**



Air- or gas-moving equipment for a heat exchange or gas-scrubbing apparatus comprises a plurality of air- or gas-moving units, each comprising a fluid operated turbine and a fan coupled to, so as to be driven by, the turbine, the turbines being connected in series for operation by a common operating fluid supply. The equipment may comprise a number of independent sets of series-connected units, the sets either being connectible in series to a common operating fluid supply, or each set connectible independently to a common operating fluid supply or each set connectible to a separate independent supply or two or more sets may be series-connected to one fluid supply and another set or sets to another fluid supply.

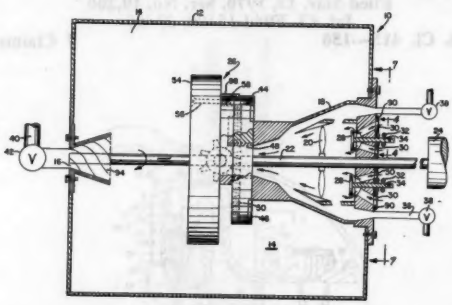
3,667,865
COMPRESSED AIR PUMP, PARTICULARLY FOR CONCRETE
Giovanni Faldi, Via Por S. Maria 4, Florence, Italy
Filed Jan. 13, 1970, Ser. No. 2,512
Claims priority, application Italy, Jan. 24, 1969, 11,982/69
Int. Cl. F04b *15/02;* **F04f** *3/36;* **F16k** *3/36*
U.S. Cl. 417—122 **6 Claims**

A pump for concrete operated by compressed air comprises two chambers (1, 1') in each of which the concrete is fed through a valve port (4, 4') in the upper part of the chamber, which port is sequentially opened and closed by a valve plug member (14, 14') including a portion (16, 16') adapted to close the orifice and a softer portion (15, 15') adapted to penetrate into said port



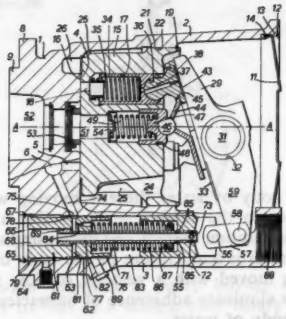
for keeping it clean from concrete particles, said valve plug member being moved in time sequence with respect to valves for introducing compressed air in said chambers and discharging concrete therefrom.

3,667,866
AIR COMPRESSOR
Lewis Richter, 1414 E. 29th St., Des Moines, Iowa 50317
Filed Mar. 4, 1970, Ser. No. 16,524
Int. Cl. F04b *23/14*
U.S. Cl. 417—203 **10 Claims**



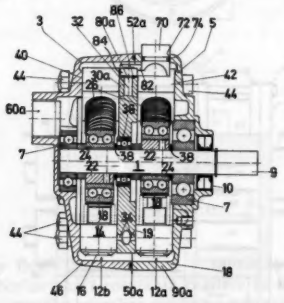
A powered shaft having a propeller, draws air into a passageway through which the shaft extends and the passageway has an outlet in communication with a compressed air chamber. Air is moved through the passageway outlet by an air transfer means which includes a stationary plate having circularly arranged teeth covered by a plate on the shaft which includes a rotatable gear registering with the teeth. An opening through the two plates communicates at times with at least one of the teeth cavities which is sealed as the rotatable plate moves over the cavity whereupon it is then exposed to the compressed air chamber and forced out by the teeth on the gear which then leaves a vacuum in the cavities to receive additional air from the opening communicating with the passageway whereupon the cycle is repeated. The air may be totally drawn into the passageway by the propeller or may enter as a result of external pressures for which appropriate inlet openings are provided. A flywheel may also be provided on the powered shaft to assist in the rotation thereof and in the sealing of the rotatable plate. Vanes may also be provided on the powered shaft in the outlet opening of the compressed air chamber to further assist in the turning of the shaft as air is released from the chamber.

3,667,867
HYDRAULIC APPARATUS
Kenneth Raymond Boydell, Bredons Hardwick, near Tewkesbury, and John Christopher Eglington Flint, Chalford Hill, Stroud, England, assignors to Dowty Technical Developments Limited, Brockhampton Park, Brockhampton, Cheltenham, England
Filed Sept. 19, 1969, Ser. No. 859,297
Claims priority, application Great Britain, Sept. 21, 1968, 44,989/68
Int. Cl. F04b *1/26;* F01b *13/04*
U.S. Cl. 417—222 10 Claims



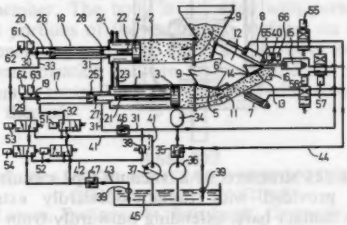
A variable-displacement pump or motor including a displacement-varying member on which a restoring force operates to urge it to one displacement limit, a hydraulic servo-cylinder containing a piston and a control unit, the piston being connected to adjust the displacement varying member and the control unit fitting into the servo-cylinder to co-operate with a high pressure port in the servo-cylinder and operating to generate a control pressure in the working space to cause adjustment of the displacement varying member.

3,667,868
RADIAL PISTON PUMP
Rudolf Brunner, Baldham, Germany, assignor to Messrs. Heilmeier & Weinlein, Munich, Germany
Filed Feb. 4, 1970, Ser. No. 8,681
Claims priority, application Germany, Feb. 11, 1969, P 19 06 773.3; Switzerland, Jan. 28, 1970, 1,202/70
Int. Cl. F04b *1/04, 23/06*
U.S. Cl. 417—273 13 Claims



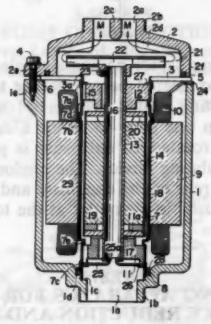
A rotary piston pump is adapted to pump hydraulic fluid. A shaft, having eccentric cams, is rotated in bearings. The cams act against pistons acting within cylinder blocks. The pistons may be spring-loaded. The cylinder blocks are arranged in rows forming an asterisk (star) shape about the shaft. Two rows sandwich a base plate having an outlet manifold. The casing members are clamped by bolts and the casing members clamp the rows of cylinder blocks and base plate.

3,667,869
DUAL CYLINDER-CONCRETE PUMP
Karl Schlecht, 91 Echterdingerstrasse, D–7024 Bernhausen-Stuttgart, Germany
Filed Feb. 26, 1971, Ser. No. 119,182
Claims priority, application Germany, Mar. 4, 1970, P 20 10 112.6
Int. Cl. F04b *17/00, 35/00, 23/04, 41/06, 15/02*
U.S. Cl. 417—346 8 Claims



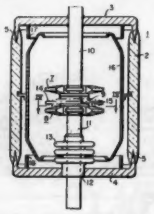
There is disclosed a dual cylinder-concrete pump in which each of the two conveying cylinders is operatively associated with a positively controlled three-way valve operatively associated with each conveying cylinder for the selective connection of each such conveying cylinder with a filling funnel and a conveying conduit or line. According to the invention a third three-way valve is arranged between the discharge openings of both three-way valves associated with the conveying cylinders and the aforesaid conveying conduit.

3,667,870
MOTOR DRIVEN PUMP
Yuji Yoshida, Neyagawa, and Noriyosi Asada and Takao Funatsu, Hirakata-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 4, 1971, Ser. No. 103,368
Claims priority, application Japan, Jan. 9, 1970, 45/3,059; Feb. 19, 1970, 45/14,674, 45/14,675, 45/14,676, 45/14,678, 45/14,679, 45/14,681, 45/14,682
Int. Cl. F04b *17/00, 35/04;* H02k *1/32, 9/00*
U.S. Cl. 417—357 12 Claims



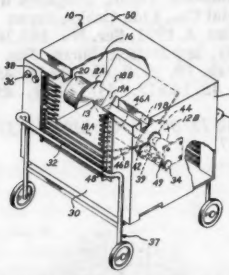
A motor driven pump comprising a stator chamber and a rotor chamber separated from each other by means of a cylindrical sleeve, a hollow rotor shaft carried by a bearing block fixed in said cylindrical sleeve, and a pump impeller secured to the tip end of said hollow rotor shaft, the hollow interior of said rotor being communicating with main liquid flow.

3,667,871
CONTACT STRUCTURES FOR VACUUM-TYPE CIRCUIT INTERRUPTERS HAVING RADIALLY OUTWARDLY-EXTENDING SPOKES
Richard L. Hundstad, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 10, 1969, Ser. No. 797,930
Int. Cl. H01h 33/66
U.S. Cl. 200—144 B 12 Claims



The contact structure of a vacuum-type circuit interrupter is provided with radially-outwardly extending spokes, or contact bars, extending outwardly from a central primary contact region. The arc is initiated at the primary contacting surfaces adjacent the central point of the separable contact structure, and, because of the provision of the outwardly extending spokes, the arc is moved outwardly to the arc-dissipation surfaces which extend to the outer periphery of the contacts. The arc is rapidly moved outwardly, and the primary arcing surfaces are thereby prevented from becoming eroded.

3,667,872
AIR CIRCULATING DEVICE
Harry B. Norman, 7803 S. Saginaw Ave., Chicago, Ill. 60649
Filed Jan. 7, 1971, Ser. No. 104,651
Int. Cl. F01d 1/02; F04b 17/00, 35/04
U.S. Cl. 417—423 6 Claims

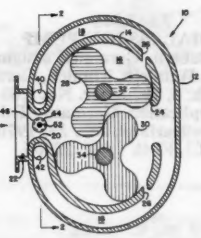


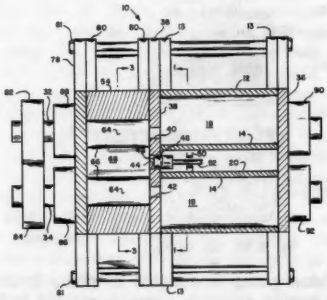
An air circulating device having a single electric motor to rotate blades connected perpendicular to and between two parallel rotating plates driven by the motor. The blades intersect on one edge to define a centerline about which the blades rotate. An enclosure is provided to enclose the air circulating device. The enclosure has an air inlet at the lower rear of the enclosure and a manually or automatically adjustable air outlet at the top of the front of the enclosure.

3,667,873
WATER MOVING APPARATUS FOR DESTRATIFICATION, ICE REDUCTION AND BARNACLE CONTROL
Roy A. Cramer, Jr., % Anchormatic, 1020 E. 79th Terrace, Kansas City, Mo. 64131
Filed Nov. 2, 1970, Ser. No. 85,898
Int. Cl. B01f 5/12; E02b 3/00; F04b 17/00
U.S. Cl. 417—424 9 Claims

A water moving apparatus for destratification, ice reduction and barnacle control in a body of water includes an elongated column member suitably mounted on a support and extending downwardly into a body of water and having a diffusing member, a submersible motor and an upwardly directed propeller associated with the motor, all being mounted adjacent a lower end of the column member whereby operation of the propeller and the diffusing member effect an upwardly and outwardly diffused flow in the body of water thereby moving warmer subsurface water to the surface and effecting a circulation that provides aeration thereof and decreasing stratification and more uniform temperature of the body of water and the water is moved with a velocity of flow sufficient to substantially eliminate adherence of barnacles to surfaces within the body of water.

3,667,874
TWO-STAGE COMPRESSOR HAVING INTER-ENGAGING ROTARY MEMBERS
Roger C. Weatherston, Williamsville, and George R. Duryea, Buffalo, N.Y., assignors to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.
Filed July 24, 1970, Ser. No. 58,009
Int. Cl. F01c 1/18, 1/30
U.S. Cl. 418—9 3 Claims

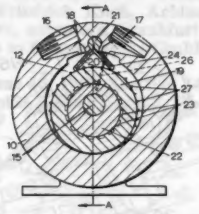




A two-staged Roots type compressor having a housing separated into two compartments by a partition, each compartment containing a working chamber having rotary mating impellers therein, inlets to each chamber and outlets from each chamber, passages in the partition communicating the outlet of one chamber with the inlet

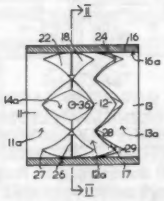
of the other chamber, a valved passage in the partition communicating the inlets of each chamber, the impellers of each chamber being mounted on common shafts.

3,667,875
PUMP
Chan Yuen Lik, Lot 5030, Hong Kong
Filed Jan. 6, 1970, Ser. No. 939
Claims priority, application Great Britain, Jan. 7, 1969, 950/69
Int. Cl. F04c *1/02*
U.S. Cl. 418—56 **1 Claim**



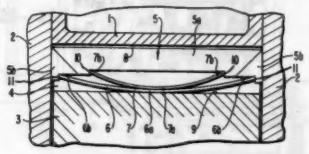
The invention provides a pump having a pumping action similar to that of a sliding vane rotary pump, but which has a non-rotary pumping element. The pump comprises a cylindrical pump chamber having an inlet port and an outlet port, a cylindrical pumping element disposed within said pump chamber said pumping element being of a diameter less than that of the pump chamber, a tongue engaged within a recess formed in the periphery of said pump chamber between said inlet and outlet ports said tongue being in operative association with said pumping operation, a cam or eccentric rotatably engaged within a bore of said pumping element, and a drive shaft carrying said cam or eccentric journalled in bearings of the pump chamber.

3,667,876
ROTARY FLUID FLOW MACHINES
Michael David Boyd, Flat 3, 136 Anderson St., South Yarra, Victoria, Australia
Continuation-in-part of application Ser. No. 826,046, May 2, 1969. This application Dec. 21, 1970, Ser. No. 99,975
Int. Cl. F02b *53/00*
U.S. Cl. 418—68 **22 Claims**



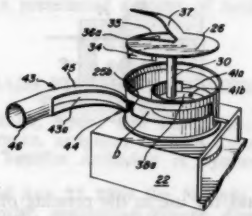
A rotary fluid flow machine comprising a body, an axial member or shaft rotatable relative to the body, and a generally annular member mounted for axial reciprocation and rotation in a generally annular cavity defined between the body and the shaft. The axial member and the body are relatively rotatable, and the annular member is provided with undulating end surfaces. The axial cavity is defined by spaced concentric inner and outer cylindrical surfaces and by a pair of axially spaced end surfaces of undulating configuration, each cooperating with a separate one of the undulating surfaces of the annular member, whereby the annular member is constrained by engagement between the two end surfaces for movement in the cavity of the type involving a first axial rotational component of motion and a second axial reciprocatory component. Between each pair of cooperating end surfaces, a plurality of chambers is defined, the volumes of which undergo cyclic variation when the annular member undergoes such movement. The annular member is affixed to a cylindrical sleeve which defines two axial cylindrical extensions to the member, one to either axial side thereof, one cylindrical surface of the sleeve slidingly engaging one cylindrical surface of the axial member. The body is provided with ports defined by root portions of the undulating surfaces on the body and cooperating transverse edges of the sleeve extensions, and communication between the ports and the respective chambers is controlled by the sleeve during reciprocating motion thereof.

3,667,877
RADIAL SEAL FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Oct. 24, 1969, Ser. No. 869,097
Claims priority, application Germany, Oct. 25, 1968, P 18 05 040.3
Int. Cl. F01c *19/02*; F03c *3/00*; F04c *27/00*
U.S. Cl. 418—121 **2 Claims**



A radial seal for a rotary piston internal combustion engine in which a sealing bar, possibly constructed of several parts, is arranged in each groove provided in the piston corners; each sealing bar is urged in the radially outward direction by a spring means that consists of two leaf springs having different radii of curvature, with the leaf spring of larger radius of curvature abutting directly against the groove bottom while the leaf spring with smaller radius of curvature rests on the curved surface of the leaf spring with the larger radius of curvature.

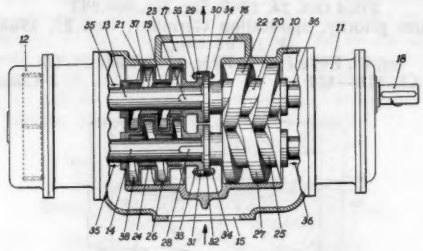
3,667,878
PUMP CONSTRUCTION
Leo C. Reeve, Lombard, Ill., assignor to Portland Cement Association, Skokie, Ill.
Filed Jan. 8, 1971, Ser. No. 104,856
Int. Cl. F01c *1/00, 11/00*; F04b *15/02*
U.S. Cl. 418—173 **20 Claims**



A pump is provided which is capable of handling a flowable product such as plastic concrete or the like. The pump includes two moving parts both of which are driven from a single power source. One moving part comprises

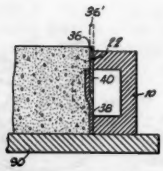
a rotating wall which cooperates with a stationary arcuate wall to form a cavity in which is disposed an impeller. The impeller is carried by the rotating wall and moves therewith. The second moving part is a substantially cylindrical member disposed within the cavity and rotatable about an axis offset but parallel to the axis of the rotating wall. The cylindrical member is provided with an opening through which the impeller extends. The cylindrical member is rotated by the impeller. The stationary arcuate wall is provided with a product discharge port and the rotating wall is provided with a product infeed port disposed rearwardly of the impeller.

3,667,879
SCREW PUMP
Orazio Cerpelli, 4 Via Giotto, Viareggio, Italy
Filed Feb. 10, 1970, Ser. No. 10,209
Claims priority, application Italy, Feb. 12, 1969, 34,901/69
Int. Cl. F01c *1/16*; F03c *3/00*; F04c *1/10*
U.S. Cl. 418—202 **3 Claims**



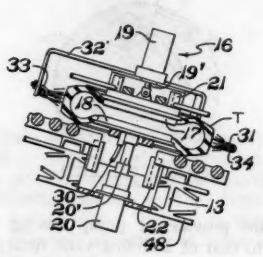
A pump of the screw type having a pair of screws of opposite pitch and means for securing together each screw as a pair on the same shaft so that axial thrust is withstood by said securing means.

3,667,880
EDGE FORM ASSEMBLY FOR PRESSING OF ARTICLES
Michael Anley Malet and David Leslie Hills, Watford, England, assignors to National Research Development Corporation, London, England
Filed Nov. 25, 1969, Ser. No. 879,879
Claims priority, application Great Britain, Nov. 26, 1968, 56,110/68
Int. Cl. B28b *3/00*
U.S. Cl. 425—3 **16 Claims**



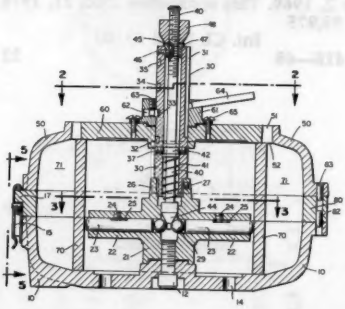
An apparatus for use in the pressing of articles comprising a vertically displaceable edge form component for the mould walls which component can be held magnetically to a locating structure during pressing. In some embodiments of the invention, the component is associated with a stationary edge form component also providing part of the mould walls. The magnets may be permanent magnets, permanent electromagnetic chucks, switchable permanent magnetic chucks or electromagnets.

3,667,881
TIRE COOLING
Francis J. Cimprich, Canton, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Continuation of application Ser. No. 660,162, July 31, 1967, which is a continuation-in-part of abandoned application Ser. No. 623,415, Mar. 15, 1967. This application Mar. 3, 1971, Ser. No. 120,700
Int. Cl. B29h *5/02, 17/00*
U.S. Cl. 425—28 **7 Claims**



Post cure inflation tire apparatus having a ring which circumferentially encompasses the tire which is subject to being held by a pair of axially spaced movable rim flanges wherein the ring directs coolant against the periphery of such tire to cool such tire to a uniform temperature.

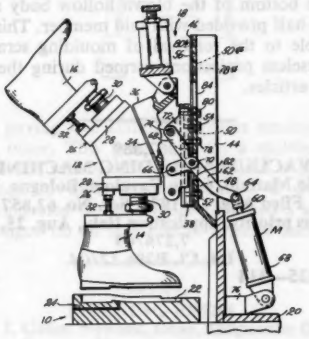
3,667,882
INDUSTRIAL TIRE MOLD
Donald H. Ross, Chalfont, Pa., assignor to Super Tire Engineering Company, Camden, N.J.
Filed Jan. 19, 1971, Ser. No. 107,746
Int. Cl. B29c *5/00*; B29d *27/00*; B29h *11/00*
U.S. Cl. 425—117 **6 Claims**



A mold for industrial tires and wheels of polyurethane and the like has a lower portion, an open-top upper portion, a cover for the upper portion, and provision for spacers between the lower and upper mold portions for adjusting the height of the mold to accommodate tires or wheels of different axial dimensions. The mold receives an annular hub to the surface of which a polyurethane or like solid tire is to be molded. The lower mold has a spindle having hollow radial arms with pins therein which may be cammed radially outwardly. A sleeve extends upwardly from the spindle through the lid of the

upper mold portion. A stem within said sleeve has a cam at its lower end and a nut at its upper end. Turning the nut causes the stem to move downwardly and cams the radial pins outwardly to press against the inner surface of the annular hub thereby to maintain the hub centered about the axis of the mold. The mold cover has a hub portion having therein cam followers which engage cam slots in the outer surface of the sleeve so that by moving the lid rotationally the lid is cammed downwardly into closed position.

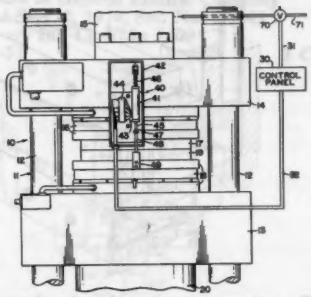
3,667,883
SHOE BOTTOM MOLDING APPARATUS
Herbert Ludwig, deceased, late of Uesen, near Bremen, Germany, by Friedrich Koch, Achim, near Bremen, and Hans Loewe, executors, Frankfurt am Main, Germany, assignors to Desma-Werke GmbH, Bremen, Germany
Filed June 10, 1968, Ser. No. 740,427
Int. Cl. B29h *5/12, 7/08*
U.S. Cl. 425—119 **18 Claims**



Injection molding apparatus embodying an open-top mold, a rotatable support for mounting two lasts for alternate disposition at a predetermined distance above the open top of the mold, a carriage mounting the rotatable support for movement vertically with respect to the mold to bring the bottom of the last located above the mold into engagement therewith for injection of bottom-forming material, and means supporting the carriage on a column for heightwise adjustment relative to the mold to accommodate lasts of different height.

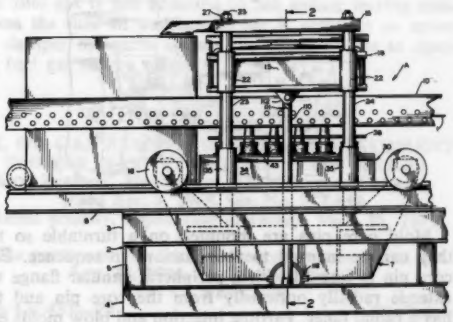
3,667,884
CONTROL APPARATUS FOR INJECTION MOLDING PRESS
Nyles V. Reinfeld, 610 Treeside Drive, Akron, Ohio 44313
Continuation-in-part of application Ser. No. 791,372, Jan. 15, 1969. This application Nov. 25, 1969, Ser. No. 879,853
Int. Cl. B29c *3/06*
U.S. Cl. 425—149 **2 Claims**

The new control for an injection molding press includes an electric signal or voltage supply means that is operatively secured to one of two relatively movable press platens, and has a member associated therewith for changing the signal produced. A contact means is operatively secured to the other of the relatively movable platens and positioned to contact the signal means when the mold sections are adjacent or in contact and vary the signal dependent upon the relative positions or movement of the mold sections on the platens. A controllable variable second signal or voltage generating or supply means is provided and electric circuit means are present to measure and compare the signals and provide an output signal under predetermined conditions, which output signal is



used for terminating actuation of the injection means in the press when the mold sections are starting to be separated.

3,667,885
MOLDING MACHINES
Richard K. Shelby, 1320 Sandburg Terrace, Chicago, Ill. 60610
Filed Nov. 5, 1970, Ser. No. 87,024
Int. Cl. B29c *17/04*
U.S. Cl. 425—155 **24 Claims**

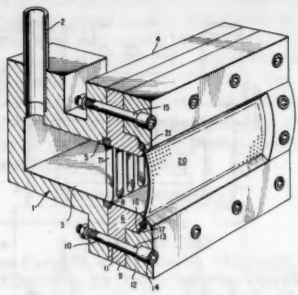


A driving mechanism for molding machines, presses and the like, where a platen is shifted with respect to a thermoplastic web. The drive mechanism includes a rotating crank which shifts a drive bar through a path where it causes a drive link to shift the platen to and from a molding position. The crank arm and an oscillating link which is connected to the other end of the drive bar creates a path of movement for the drive link which includes a dwell period sufficient for the platen to remain in the molding for a preselected amount of time.

3,667,886
MAN-MADE FILAMENT SPINNERET AND EXTRUDER HEAD
Charles Gauthier, Lyon, and Jean-Marie Vincent, Le Coteau, France, assignors to CTA-Compagnie Industrielle de Textiles Artificiels et Synthetiques, Paris, France
Filed Aug. 21, 1969, Ser. No. 851,800
Claims priority, application France, Aug. 21, 1968, 163,686
Int. Cl. D01d *3/00*
U.S. Cl. 425—192 **7 Claims**

A spinneret for use in extrusion of man-made fibers and a novel extruder head equipped with the spinneret. The

spinneret is rectangular and arcuate along its width with the marginal edges of the spinneret of substantially the same arcuate configuration as the spinneret face through-



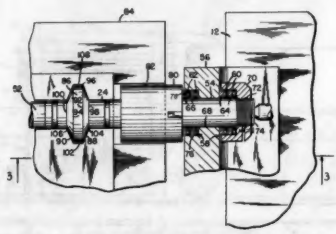
out. The spinneret is adapted to be clamped to a mating arcuate marginal portion of the extruder head to thereby assure an impervious connection between the head and the spinneret.

3,667,887

CORE PIN MOUNTING MEANS FOR INJECTION MOLDING APPARATUS

Oscar Reiss, Great Neck, N.Y., assignor to APL Corporation, Brooklyn, N.Y.

Filed Nov. 6, 1969, Ser. No. 874,662
Int. Cl. B29c *17/07*; B29f *1/022*
U.S. Cl. 425—242 **3 Claims**



Mold core pins are mounted on a turntable so that they can be indexed to four stations in sequence. Each core pin is formed with a peripheral annular flange that extends radially outwardly from the core pin and that has a radial taper. Partible injection and blow molds each having at least two sections are engageable with the core pins at selected stations. The molds cooperate with the core pins to form mold cavities. Each section of each mold is formed with a recess, and each of the recesses is tapered complementally to the core pin flanges. When the mold sections are closed about the core pins, the flanges enter the recesses. The connection between each core pin and the turntable is resilient so that the core pins when engaged are positioned by the interaction of the flanges and recesses. At all other times, the core pins are positioned by their resilient connections to the turntable.

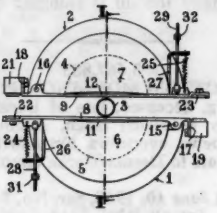
3,667,888

DEVICE FOR REMOVING BOTTOM SCRAPS OF EXTRUSION-BLOWN HOLLOW THERMOPLASTIC BODIES

Hunert Blanchard, Le Havre, France, assignor to Sidel, Le Havre, France

Filed June 12, 1970, Ser. No. 45,727
Claims priority, application France, June 18, 1969, 6920326
Int. Cl. B29d *23/03*
U.S. Cl. 425—307 **14 Claims**

This invention relates to the moulding of thermoplastic articles by the so-called extrusion-blowing process and provides a device for separating in a mould the bottom scrap formed in the mould bottom, this device comprising in at least one of the mould halves, at the level of said bottom scrap, a member on which said scrap is adapted to be crushed during the mould closing movement and said member is also adapted, during the mould opening



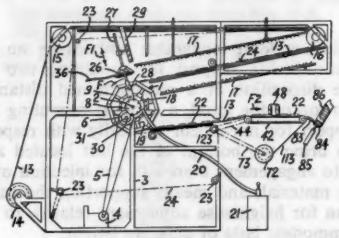
movement, to produce a displacement of said scrap in relation to the bottom of the blown hollow body retained in the mould-half provided with said member. This invention is applicable to the removal of moulding scraps, wastes and like useless projections formed during the moulding of hollow articles.

3,667,889

VACUUM MOULDING MACHINE

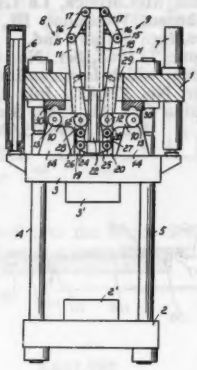
Nerio Martelli, 6 Via Cavaioni, Bologna, Italy

Filed Aug. 14, 1970, Ser. No. 63,857
Claims priority, application Italy, Aug. 25, 1969, 7,274/69
Int. Cl. B29c *17/04*
U.S. Cl. 425—314 **24 Claims**



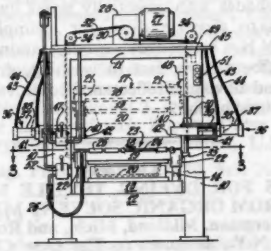
A vacuum moulding machine for forming unilaterally directed projecting moulds in continuous webs of thermoplastic synthetic material, comprising a driven rotatable drum, a plurality of suction moulds disposed peripherally around the drum, an automatically controlled vacuum distributor device connecting the suction moulds to a vacuum, and an endless cutting band traversing the web with its cutting portion parallel and adjacent to the web on the side of the projecting mouldings with its cutting edge directed in the opposite direction to the direction of movement of the web, the web passing around and held by suction in contact with the moulds on a portion of the drum periphery while the moulds are formed unilaterally in the web and the cutting device cuts the moulded portions from the web. The cutting band is askew to the direction of web movement and guides are provided for the band cutting portion. A support is provided for the web adjacent to the cutting band and thrust rollers press the web edges against the support. Stacking means are provided for stacking the moulds severed from the web.

3,667,890
PRESS
Sergio Rusmini, Via Bodio 16, Milan, Italy
Filed May 5, 1970, Ser. No. 34,687
Claims priority, application Italy, Apr. 16, 1969, 19,696/69
Int. Cl. B29f *1/00*; B30b *1/16*
U.S. Cl. 425—406 8 Claims



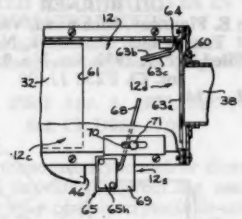
A press having two stationary plates arranged spaced from each other. This press includes a mobile plate arranged between said stationary plates and a plurality of toggles. Each of these toggles includes a shorter arm pivotally connected to the mobile plate and a longer arm which is hinged on its free end to a guide member.

3,667,891
MOLDING PRESS
Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation
Filed Aug. 13, 1969, Ser. No. 849,671
Int. Cl. B30b *5/02*; B29c *3/00*
U.S. Cl. 425—408 5 Claims



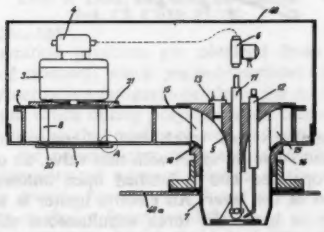
A low-cost, high-speed press for molding plastic articles having a movable upper platen and a fixed lower platen with opposed matching dies attached thereto. The upper platen is moved between a remote upper position to a lower molding position at high speed by a motor-driven suspension system. When the upper platen is in the lower molding position, a plurality of platen stops are moved into locking position to prevent upward movement of the upper platen and molding force is applied by means of a fluid-filled pressure bag positioned between the die plates and one of the platens. The platen stops are adjustable in height to compensate for variable heights in the dies used with the press and vertical platen guides assure mold alignment throughout the range of movement by the upper platen.

3,667,892
CONTROL MEANS FOR PRESSURIZED GAS-FIRED SPACE HEATER
Richard C. Barnett and James D. Boucher, Tyler, Tex., assignors to General Electric Company
Filed Sept. 2, 1970, Ser. No. 69,043
Int. Cl. F23n *5/00*
U.S. Cl. 431—31 3 Claims



This invention provides means for controlling the supply of combustion air and fuel gas to gas-fired space heater means employing pressurized combustor means including a fuel gas-air mixing area having a valved source of fuel gas and a source of pressurized combustion air fluid-connected to it. The present invention interposes movable damper means between the combustion air source and the gas-air mixing area and switch means actuatable by movement of the damper means in response to combustion air flowing between the combustion air source and the gas-air mixing area to control the opening and closing of the fuel gas source valve such that fuel gas is not admitted to the gas-air mixing area unless the flow of combustion air is sufficient to move the damper means to actuate the switch means to open the fuel gas source valve.

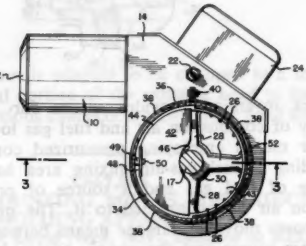
3,667,893
OIL OR GAS BURNER WITH A CROSS-CURRENT BLOWER HAVING RETURN FLOW MEANS
Kurt Zenkner, Hertzstrasse 12, Ettlingen, Germany
Filed Apr. 1, 1968, Ser. No. 717,698
Claims priority, application Germany, Mar. 31, 1967, Z 12,777
The portion of the term of the patent subsequent to Aug. 27, 1985, has been disclaimed
Int. Cl. F23n *5/08*
U.S. Cl. 431—79 35 Claims



An oil or gas burner has a casing formed by a lower casing member and a cover plate forming an elongated casing with rounded ends. A blower rotor is located in an opening in one of the ends, the casing wall adjacent the opening forming a guide plate at the intake side of the rotor. The angle between the tangent to the casing wall at the beginning of the guide plate and the tangent to the casing wall at the other end of the rounded end portion is less than 90°, preferably 30°–60°. There is provided at the other side of the rotor from the guide plate, where the rotor is slightly spaced from the longitudinal wall of the casing, a vortex baffle-plate which tapers

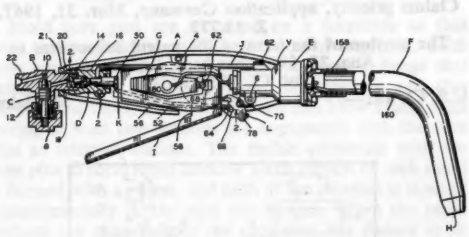
in cross-section towards the periphery of the rotor, and between which and the end portion of the longitudinal wall one or more passages are formed through which some of the air fed by the rotor can be returned from the pressure-side to the suction-side.

3,667,894
OIL BURNER
Norman E. Flournoy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.
Filed Dec. 7, 1970, Ser. No. 95,651
Int. Cl. F23d *11/00*
U.S. Cl. 431—114 **4 Claims**



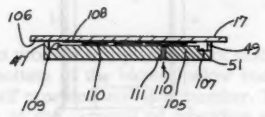
A gun type oil burner provided with a baffle plate between the blower and air inlet, combined with sound deadening material so arranged as to materially lessen the fan noise.

3,667,895
ELECTRICALLY IGNITED GAS TORCH WITH LAMINAR GAS FLOW IN REMOVABLE TIP
Albert Ross, Willowick, Ohio, assignor to Harris Calorific Company, Cleveland, Ohio
Filed Sept. 18, 1970, Ser. No. 73,577
Int. Cl. F23q *3/00*
U.S. Cl. 431—255 **14 Claims**



A plumber's gas torch has a conventional flame-adjustment valve; in series with that valve, an on-off valve is lever-operated and is latched open automatically on operation of the lever. An electric igniter is actuated by the lever to ignite the torch simultaneous with opening of the on-off valve. Another series valve is automatically closed when the torch tip is unscrewed and is reopened as another tip is attached. A trigger releases the latch and allows the on-off valve to close under spring pressure. The electric igniter has a grounded metal frame, and the torch handle and connected parts are electrically conductive. The voltage generated by the ignition device is transmitted to a spark gap in the torch tip near the flame end thereof by a series of conductors insulated from the handle and torch tip, and including an insulated conductor wire lying in the torch tip adjacent the wall. Several diameters upstream of the spark gap and also the flame end, the insulated conductor leaves its position against the torch tip wall and is spaced therefrom so as not to interfere with laminar flow of the combustible gas and air mixture approaching the flame, thus avoiding an unstable flame which would result from turbulent flow.

3,667,896
APPLYING FILM OF STAIN TO TISSUE MOUNTED ON A MOVING SLIDE
James Benjamin McCormick, La Grange, and Leighton Clifford Johnson, Westmont, Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Application June 7, 1965, Ser. No. 461,613, now Patent No. 3,431,886, which is a continuation-in-part of application Ser. No. 379,822, July 2, 1964. Divided and this application Oct. 21, 1968, Ser. No. 822,752
Int. Cl. D06p *3/00*
U.S. Cl. 8—3 **1 Claim**



Apparatus and the method of operation thereof is described for conveying objects, such as microscope slides, over a flat liquid applying surface and injecting a treating liquid into the space between the object and the surface.

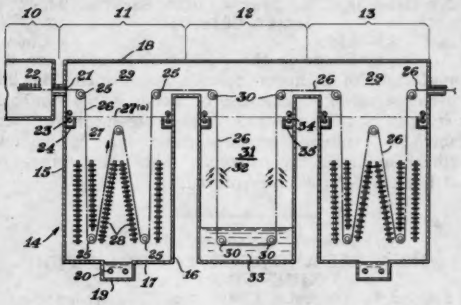
3,667,897
UNIFORMLY DYED YELLOW TO NAVY BLUE WATER SWELLABLE CELLULOSIC FIBERS
John Blackwell, Kennett Square, Pa., and Masuo Toji, Stratford, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Nov. 25, 1969, Ser. No. 879,899
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 C **5 Claims**

Water swellable cellulosic fibers, for example, cotton, or blends or mixtures thereof with synthetic fibers, for example, polyester fibers, uniformly dyed to yellow to navy blue shades with essentially water insoluble, monoazo or disazo disperse dyes, for example, 2-chloro-4-nitro-4' - [N,N - bis(benzoyloxyethyl)amino]azobenzene, said dyed fibers being fast to washing, drycleaning and crocking and having a reflectance color value (S') after scour of at least about 2.

3,667,898
PROCESS FOR DYEING TEXTILE MATERIALS FROM ORGANIC SOLVENT MEDIA
Sylvester Bergman, Midland, Mich., and Ross R. Dawson, Buffalo, N.Y., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of application Ser. No. 670,433, Sept. 25, 1967. This application May 26, 1969, Ser. No. 827,620
Int. Cl. D06p *1/68*
U.S. Cl. 8—94 **19 Claims**

The present invention concerns a method for dyeing textile fibers, particularly in their woven, yarn or loose mat state, employing dyestuffs dissolved or dispersed in organic solvents, particularly chlorinated hydrocarbon solvents, for fixing the dyestuff into the fiber during the process and for recovering substantially completely the solvent from the dyed fabric. The technique of the present invention employs compositions comprising hydrophobic organic solvents alone and/or in admixture with co-solvents, swelling agents and fixatives which are compatible with the solvent and the soluble and/or dispers-

ible organic dyestuffs. The novel method comprises applying solvent compositions of dyestuffs to textiles, diffusing



and fixing the dyestuff into the textile fibers while maintaining the textile fiber in a zone filled with the vapors of a solvent boiling between about 40° C. and the softening point of the fiber, and recovering the solvent either contemporaneosuly with said fixation or in a rinse step following said fixation.

3,667,899

DYEING OF POLYACRYLONITRILE TEXTILE MATERIALS WITH CATIONIC DYES IN THE PRESENCE OF AROMATIC ESTERS

James J. Hartnett, Newark, and Robert Felgin, West Orange, N.J., assignors to Sybron Corporation, Rochester, N.Y.

No Drawing. Filed Apr. 3, 1970, Ser. No. 25,578
Int. Cl. D06p 5/04
U.S. Cl. 8—173 25 Claims

Esters of the monocarboxylic and/or dicarboxylic aromatic acids and derivatives thereof are used as leveling agents in the dyeing of polyacrylonitrile-containing materials with cationic dyes. Level dyeing of polyacrylonitrile moieties are achieved without loss of color yields or bulking effects.

CHEMICAL

3,667,900

METHOD OF DYEING NATURAL AND SYNTHETIC FIBERS

Averal T. Trimble, Jr., Charlotte, N.C., assignor to CaroChem Corporation, Charlotte, N.C.

No Drawing. Filed Nov. 10, 1969, Ser. No. 875,557
Int. Cl. D06p 5/04
U.S. Cl. 8—173 2 Claims

A textile dyeing process wherein a methyloxolane is employed as a carrier alone and in combination with other known carriers.

3,667,901

METHOD OF PRODUCING ORTHOVANADATES OF RARE-EARTH METALS

Vsevolod Semenovich Krylov, Ulitsa Tereshkovoi 2, kv. 65; Ivan Nikolaevich Popkov, Ulitsa Tereshkovoi 2, kv. 14; Robert Leonidovich Magunov, Ulitsa Ostrovidova 30, kv. 16; and Mikhail Nikolaevich Puring, Ulitsa Tereshkovoi 2, kv. 37, all of Odessa, U.S.S.R.; Khachatur Saakovich Bagdasarov, Ulitsa Garibaldi 59, korpus 2, kv. 42, Moscow, U.S.S.R.; Raisa Fedorovna Sagina, Ulitsa Tereshkovoi 2, kv. 28, Odessa, U.S.S.R.; and Viktor Innokentievich Popov, Ulitsa Lenina 24, kv. 16, Fryazino Moskovskoi Oblast, U.S.S.R.

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,143
Int. Cl. C22b 59/00
U.S. Cl. 23—19 V 2 Claims

A method of producing orthovanadates of rare-earth metals, consisting in that aqueous solutions of nitrates of rare-earth metals are prepared with pH=5.5–6.2, and an aqueous solution of ammonium metavanadate is prepared with pH=9.8–11, whereupon said solutions are interacted under dynamic conditions with Re=1000–6000, till the pH of the medium becomes equal to 9.5–10.5. The resulting precipitate of the orthovanadate of a rare-earth metal is separated from the solution, dried at a temperature of 80–120° C., and then calcined at a temperature of 900–1200° C.

The present method makes it possible to preclude the formation of polyvanadates and to obtain chemically and granulometrically homogeneous desired products, adequate to meet the requiremens of various branches of engineering and industry, such as quantum electronics, analytical chemistry, color television.

3,667,902

MANUFACTURE OF SODIUM CARBONATE

Joseph Kay and Ernest Blumenthal, Northwich, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Jan. 12, 1970, Ser. No. 2,371
Claims priority, application Great Britain, Jan. 23, 1969, 3,944/69
Int. Cl. C01d 7/12
U.S. Cl. 23—63 11 Claims

A process for the manufacturer of sodium carbonate monohydrate which comprises the step of reacting an aqueous solution of sodium hydroxide with an aqueous suspension of sodium sesquicarbonate at an elevated temperature in the presence of an excess of bicarbonate ions.

3,667,903

PROCESS FOR PRODUCING POLYMERIC ALUMINUM-AMIDO-POLYPHOSPHATE

Ernest Stossel, 203 W. 81st St., New York, N.Y.

No Drawing. Filed Oct. 16, 1968, Ser. No. 768,188
The portion of the term of the patent subsequent to Dec. 3, 1985, has been disclaimed
Int. Cl. C01b 25/00
U.S. Cl. 23—105 7 Claims

Polymerization products are obtained from aqueous solutions of reactants which are polymerizable at an elevated polymerization temperature above the boiling point of water and which during polymerization become highly viscous or rigid so that mixing of, and uniform heat transfer within, the polymerizing mass are impeded, by subjecting a concentrated aqueous solution of the reactants, which may contain foaming and foam stabilizing agents, to foaming so that a foam consisting of a dispersion of a gas in a continuous liquid phase is formed, the liquid phase consisting of the solution of the reactants being present in the form of thin foam lamellae. The thus-formed foam is then maintained at polymerization temperature until the desired degree of polymerization of the reactants has been reached within the lamellae, and during this polymerization the foam bubbles of the foamed mass are continuously displaced relative to each other. It is acheived thereby that the reaction mixture, due to being in foamed condition, remains easily stirrable and this facilitates relative displacement of the foam bubbles and thereby uniform heat transfer throughout the entire foam mass. Furthermore, the polymerization of the

lamellae-forming reaction mixture will take place at an elevated pressure caused by the expansion of the dispersed gas within the individual foam bubbles during the heating of the foam to polymerization temperature.

3,667,904
PROCESS FOR THE SEPARATION OF MIXTURES OF PHOSPHORIC AND NITRIC ACID
Andre Roche and Robert Amaurich, Toulouse, and Gilbert Cousserans, Portet, France, assignors to Azote et Produits Chimiques S.A., Toulouse, France
Continuation-in-part of application Ser. No. 698,829, Jan. 18, 1969. This application Apr. 13, 1970, Ser. No. 28,118
Claims priority, application France, Jan. 26, 1967, 92,529; Aug. 17, 1967, 118,085
Int. Cl. C01b *25/28*
U.S. Cl. 23—107 5 Claims

This invention is directed to a process for the preparation of monoammonium phosphate by ammoniation of mixtures of phosphoric and nitric acids in the presence of at least partially water-miscible C_1 to C_8 alkanol characterized in that the alcoholic solution to be ammoniated contains 16 to 8% of water.

3,667,905
CONTINUOUS PRODUCTION OF ALUMINIUM SULPHATE
George H. Jennings, 23 Crimea St., St. Kilda, Victoria, Australia
No Drawing. Filed July 29, 1970, Ser. No. 59,325
Claims priority, application Australia, Aug. 6, 1969, 59,156/69
Int. Cl. C01f *7/00*
U.S. Cl. 23—123 6 Claims

A continuous process for the production of aluminium sulphate, either as alum crystals or alum solutions in commercial concentrations at ambient temperature, in which sulphuric acid at concentrations of 20–100% and dry alumina hydrate or bauxite or other form of aluminium hydroxide, together with diluent feed water as may be required depending upon the concentration of the sulphuric acid used, are separately fed to the inlet of a multi-pass heat-exchange tubular reactor, the mixture of reactants being at a temperature of 70–120° C. when fed into said reactor and being rapidly brought to a temperature of 110–120° C. after entering said reactor and being maintained at a temperature of 110–120° C. in traversing said reactor to the outlet.

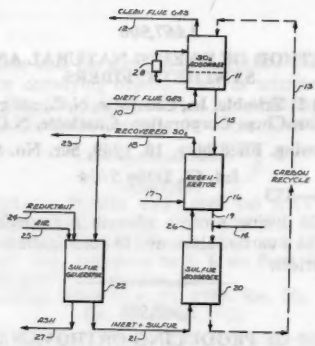
3,667,906
METHOD FOR PRODUCING MANGANESE DIOXIDE CONTAINING LESS POTASSIUM
Seiya Sasaki, Yamagata, Japan, assignor to Tekkosha Co., Ltd., Tokyo, Japan
No Drawing. Filed May 11, 1970, Ser. No. 36,417
Claims priority, application Japan, May 15, 1969, 44/36,995
Int. Cl. C01g *45/02*; B01k *1/00*
U.S. Cl. 23—145 3 Claims

An ore containing a decreased amount of potassium is obtained by reducing-roasting manganese oxide ores containing potassium, thereby converting manganese components in the ores into MnO, and removing potassium components from the reduced-roasted ores by extracting them with water at elevated temperatures. Into the resulting ore containing the decreased amount of potassium is added an acid to extract the manganese components and, furthermore, by oxidizing the manganese components in the second extract thus obtained electrolytically or with an oxidizing agent, manganese dioxide containing less potassium can be obtained.

3,667,907
MANUFACTURE OF HYDROGEN CYANIDE
John Derek Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 4, 1970, Ser. No. 34,577
Int. Cl. C01c *3/02*
U.S. Cl. 23—151 4 Claims

An improvement in the Andrussow process for the manufacture of hydrogen cyanide is provided. The improvement comprises the use of steam in the synthesis mixture in place of nitrogen which is present in air. Preferably, a synthesis mixture containing by volume methane/ammonia/steam/oxygen within the range of 1–2:1:1:1 to 1–2:1:4:1 is employed.

3,667,908
REMOVAL AND RECOVERY OF SULFUR OXIDES FROM GASES
Samuel L. Torrence, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.
Continuation of abandoned application Ser. No. 724,777, Apr. 29, 1968. This application Nov. 27, 1970, Ser. No. 93,485
Int. Cl. C01b *17/60*
U.S. Cl. 23—178 3 Claims



A process for removing sulfur dioxide and sulfur trioxide from a gaseous stream whereby sulfur dioxide is oxidized to sulfur trioxide and the sulfur trioxide is adsorbed onto an activated carbon adsorbent having elemental sulfur adsorbed thereon; thereafter the adsorbent is regenerated producing sulfur dioxide and activated carbon adsorbent with a minimal loss of adsorbent due to burnoff; elemental sulfur is adsorbed onto the regenerated adsorbent and the adsorbent is then recycled to contact the gaseous stream and the sulfur dioxide produced during regeneration is recovered.

3,667,909
METHOD FOR THE PREPARATION OF ULTRA HIGH PURITY SiO_2 IN A POROUS BEAD FORM
Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc.
No Drawing. Filed Aug. 6, 1970, Ser. No. 61,843
Int. Cl. C01b *33/00*
U.S. Cl. 23—182 R 22 Claims

There is disclosed the preparation of high purity, silicon oxide in the form of porous beads of a high surface area by hydrolyzing a silicon alkoxide dissolved in a hydroxyl containing organic solvent with less than a stoichiometric amount of water so as to provide a partially hydrolyzed soluble intermediate product. The resulting partially hydrolyzed intermediate product is then treated with an immiscible organic medium so as to form a discontinuous phase of liquid partially hydrolyzed intermediate product dispersed in a continuous phase of organic

medium. The dispersed intermediate product is then treated with a base and a quantity of water sufficient to hydrolyze residual alkoxy groups in the dispersed intermediate product. The resulting mixture is stirred until the dispersed intermediate is converted to firm, hard, solid, porous beads of silicon oxide. The beads are typically recovered by filtration and evaporation of non-solid residues or by like method.

3,667,910
PROCESS FOR REMOVING SULFUR OXIDES FROM WASTE GAS
Yoshitomo Eguchi, Takarazuka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Aug. 27, 1969, Ser. No. 853,440
Claims priority, application Japan, Aug. 27, 1968, 43/61,322; May 13, 1969, 44/36,774
Int. Cl. C01b *17/56, 17/60*
U.S. Cl. 23—178 **4 Claims**

In the process for removing sulfur oxides from waste gases with employment of activated carbon as the adsorbent, the chemical exhaustion of activated carbon and the lowering of its ability for adsorbing sulfur oxides in the regeneration step can be remarkably prevented by regenerating the sulfur oxides-adsorbing activated carbon with the desorbent containing carbon monoxide gas and/or hydrogen gas in a concentration at least about 40% at a temperature from about 230° C. to about 450° C. The most advantageous results can be attained by employing vanadium oxide-supporting activated carbon as the adsorbent.

3,667,911
METHOD OF TREATING SOLIDS WITH HIGH DYNAMIC PRESSURE
Anthony S. Balchan and George R. Cowan, Woodbury, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 4, 1969, Ser. No. 804,194
Claims priority, application Great Britain, June 28, 1968, 31,117/68
Int. Cl. C01b *31/06, 21/06*
U.S. Cl. 23—209.1 **7 Claims**

A process for treating solid materials with controlled, very high, dynamic pressures all or a portion of the total pressure rise occurring in a shock compression and any remaining portion occurring as a smooth, rapid (non-shock) compression, the pressure being released smoothly to ambient conditions, comprising subjecting the lateral boundaries of a body of a solid material to a pressure pulse moving at practically constant velocity in the direction of the body's axial dimension and having practically uniform magnitude and duration over the lateral boundaries, the magnitude and duration being sufficient to sustain a shock wave of substantially uniform intensity spanning a major portion of the body between the lateral boundaries. The process is useful in converting non-diamond carbon to diamond and hexagonal boron nitride to cubic and wurtzitic boron nitride and in compacting solid materials such as silicon carbide powder.

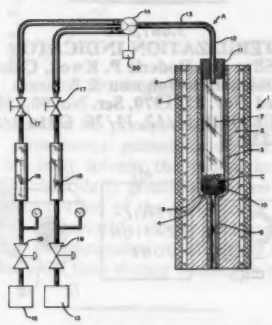
3,667,912
CHEMICAL PRODUCTION OF CHLORINE
Daniel J. Jaszka, Tonawanda, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Dec. 21, 1970, Ser. No. 100,463
Int. Cl. C01b *7/02, 11/02*
U.S. Cl. 23—219 **12 Claims**

Substantially pure chlorine is produced under reaction conditions commonly employed for chlorine dioxide production, involving reaction of a chlorate, chloride and a mineral acid, by catalyzing the reaction with hexavalent molybdenum.

3,667,913
CHROMIUM-DIOXIDE-CATALYST
Franz Hund, Krefeld-Bockum, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Continuation of application Ser. No. 660,690, Aug. 15, 1967. This application May 4, 1970, Ser. No. 33,148
Int. Cl. C01b *7/04*
U.S. Cl. 23—219 **6 Claims**

Chromium-dioxide of rutile-type crystal-structure and modified chromium-dioxide containing oxides and/or fluorides of cations which have radii in the range between 0.46 and 0.91 A. can be used as catalysts with high and permanent activity to promote oxidation-processes such as oxidation of hydrogen-chloride to chlorine and water, conversion of sulfur-dioxide to sulfur-trioxide oxidation of carbon-monoxide to carbon-dioxide, oxidation of ammonia to nitric oxides, oxidation and oxychlorination of hydrocarbons, combustion of hydrogen or alcohols and the like. The chromium-dioxide or the modified chromium-dioxide can be used as such or together with carriers. Furthermore it is possible to combine the chromium-dioxide catalysts with other catalytically active materials.

3,667,914
APPARATUS AND PROCESS FOR TESTING EXHAUST GAS CATALYST SYSTEMS
Charles R. Penquite, Ballwin, and George E. Barker, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Nov. 3, 1970, Ser. No. 86,549
Int. Cl. G01n *7/00, 9/32*
U.S. Cl. 23—230 PC **22 Claims**

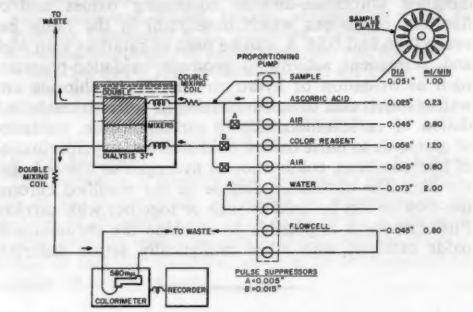


An apparatus and process for testing catalytic systems used in the treatment of exhausts from hydrocarbon combustion engines. The apparatus comprises a system which includes a reactor system holding a sample tube. The sample tube is provided with a diametrally reduced portion having a glass wool plug therein and the catalyst to be tested is disposed upon this plug. The sample tube is inserted in an electric resistance heater or furnace. A predetermined exhaust gas mixture or mixtures is passed through the catalyst bed at a desired test temperature. Periodically, without removing the catalyst sample from the sample tube, a pressure drop measurement is made across the sample tube in order to determine the degradation of the catalyst bed. The exhaust gas mixtures are passed through the catalyst bed at a predetermined rate designed for laboratory scale equipment. However, when the pressure drop measurement is made, a carefully controlled and precisely reproducible gas flow rate appropriate for measuring catalyst degradation by pressure drop measurement is used.

3,667,915
COLORIMETRIC METHODS AND COMPOSITIONS FOR DETERMINING IRON IN BLOOD

Bernard Klein, New Hyde Park, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of application Ser. No. 764,616, Oct. 2, 1968. This application Apr. 28, 1970, Ser. No. 32,755
Int. Cl. G01n *21/26, 31/22, 33/18*
U.S. Cl. 23—230 B 6 Claims

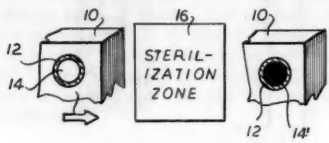


A diagnostic kit is described comprising as a first reagent a reducing agent and, as a second reagent, a buffered 5-(pyridyl)-2H-1,4-benzodiazepine, or a water-soluble acid addition salt thereof. The enzodiazepine is buffered with a buffer pair comprising a water-soluble salt of acetic acid and either ascorbic acid or acetic acid. Also described is a method of utilizing these reagents in aqueous solution in a continuous flow quantitative analysis of the iron in serum.

3,667,916
STERILIZATION INDICATOR

Martin E. Sliva and Roderic P. Kwok, Chicago, Ill., assignors to Johnson & Johnson

Filed Nov. 17, 1970, Ser. No. 90,238
Int. Cl. G01k *11/12, 11/20;* G01n *3/22*
U.S. Cl. 23—230 R 11 Claims



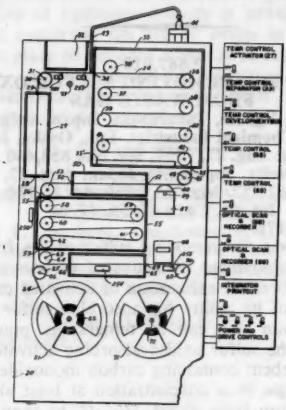
Low-cost telltale composition, which changes from a substantially light color to a substantially dark color under either steam or ethylene oxide sterilization conditions but is otherwise substantially insensitive to normal ambient environmental conditions including daylight, comprises a solution or dried solution of silver nitrate and a buffering quantity of a nitrate preservative selected from the group consisting of nitric acid, sodium nitrate or potassium nitrate. The telltale composition in aqueous alcoholic solution is printable on any substrate without imparting substantial color thereto, but is selectively colorable by the addition of desired pigments or dyes.

3,667,917
CHROMATOGRAPHY APPARATUS AND METHOD

Marcus K. Brandt, Easton, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Nov. 27, 1970, Ser. No. 93,064
Int. Cl. B01d *15/08;* G01n *31/08*
U.S. Cl. 23—230 R 20 Claims

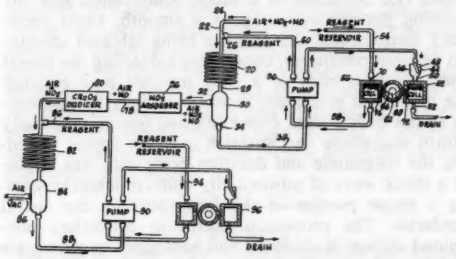
Method and apparatus for automatically performing manipulations in thin layer chromatography, whether it be horizontal or vertical, continuously, including coordinated mechanism for automatically applying sample to chromatographic test areas in sequence on a unitary base, mechanism for moving such test areas continuously into contact with solvent, and mechanism for activation of developing, color reaction, delay, drying, and densitometric analysis, as well as feed and take-up, the apparatus including means responsive at intervals to indicia on the base related to the chromatogram to activate and deactivate portions of the apparatus and to relate the chromatographic operations to the progress of the chromatographically active areas through the machine.



3,667,918
METHOD AND APPARATUS FOR ANALYSIS OF NO AND NO_2

Norman A. Lyshkow, Chicago, Ill., assignor to Pollution Monitors, Inc., Chicago, Ill.

Filed Feb. 17, 1971, Ser. No. 116,188
Int. Cl. G01n *31/06, 21/06*
U.S. Cl. 23—232 R 14 Claims



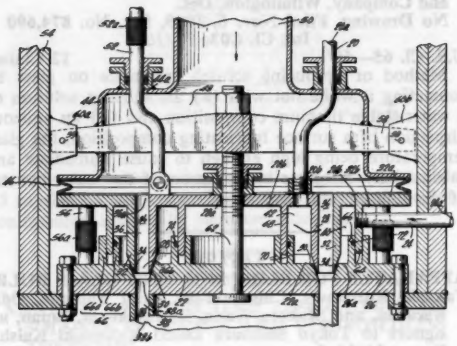
Method and apparatus for determining the concentration of NO and NO_2 in gas sample in which a gas sample containing NO and NO_2 is first passed through a scrubber in which the sample is contacted with a reagent solution capable of development of color in response to contact with NO_2, with the intensity of the color thus developed being a measure of the NO_2 content of the gas sample, and then the unabsorbed gases are treated to remove residual amounts of NO_2 and the NO in the sample is oxidized to NO_2 which is absorbed in a second scrubber with a reagent solution capable of development of color in response to contact with NO_2, with the intensity of color developed in the second scrubber being a measure of the NO content of the gas sample.

3,667,919

SULFONATION REACTOR HEAD OF IMPROVED ADJUSTABILITY

Rudolph E. Denzler, Stirling, and Charles F. Fischer, Jersey City, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,237
Int. Cl. B01j 1/00; C07b 13/06
U.S. Cl. 23—285 7 Claims



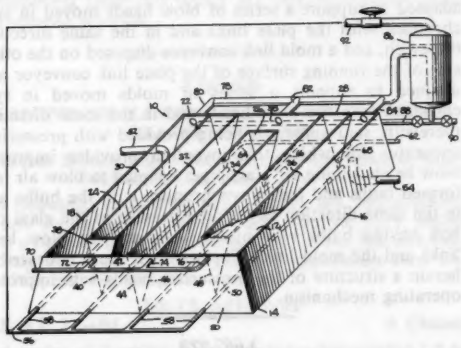
A reactor head for a sulfonation reactor in which the feed gap for the inner orifice ring is adjustable and the feed gap for the outer orifice ring is separately adjustable, the adjusting mechanisms for the inner and outer rings are calibrated so that an operator may at all times be aware of the size of the gap. The inner and outer gaps may range from zero gap to as large a gap as may be desired.

3,667,920

MIXING TRAYS

Ernest Koref, Panama City, Republic of Panama, and Elijah E. Petty, Mount Zion, Ill., assignors to M. Neumunz & Son, Inc., New York, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,452
Int. Cl. B01j 9/16; C11c 3/12
U.S. Cl. 23—288 E 22 Claims



Method and apparatus for agitating a liquid, promoting a reaction between a liquid, a solid and/or a gas or maintaining or changing the temperature of a liquid. The liquid is passed along the length of an inclined side wall and the gas for agitation and/or mixing is passed upwardly along the inclined surface of the side wall to mix with the liquid.

3,667,921

FLUX GROWTH OF RARE EARTH FLUORIDES

William H. Grodkiewicz, Murray Hill, and Le Grand G. Van Uitert, Morris Township, Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 7, 1969, Ser. No. 848,285
Int. Cl. B01j 17/04; C01f 17/00
U.S. Cl. 23—300 7 Claims

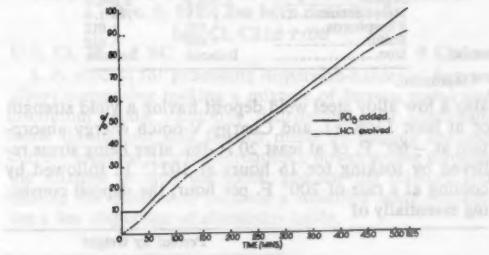
Rare earth fluorides are grown from a liquid phase which includes a flux ingredient such as beryllium fluoride. Improved effectiveness of the product as an up-converting phosphor is attributable in part to the gettering action of the flux ingredient for oxygen.

3,667,922

PRODUCTION OF CYCLIC PHOSPHONITRILIC CHLORIDE POLYMERS

James Ernest Proctor, London, England, Norman Lovelace Paddock, Vancouver, British Columbia, Canada, and Harold Trevor Searle, Streetly, England, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of application Ser. No. 185,389, Apr. 5, 1962, which is a continuation-in-part of application Ser. No. 807,749, Apr. 21, 1959, now abandoned. This application Sept. 15, 1969, Ser. No. 871,406
Int. Cl. C01b 21/52, 25/10
U.S. Cl. 23—357 3 Claims



In the production of phosphonitrilic chlorides by the reaction of phosphorus pentachloride and ammonium chloride in an inert solvent the proportion of trimeric phosphonitrilic chloride is greatly increased by adding at least a major proportion of the phosphorus pentachloride to the ammonium chloride slowly and evenly during a period of time corresponding to about 50 to about 100 percent of the total time during which the reaction takes place.

3667,923

PREPARATION OF LITHIUM, SODIUM AND QUATERNARY AMMONIUM CYANOBORO-HYDRIDES

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

No Drawing. Filed June 16, 1969, Ser. No. 833,722
Int. Cl. C01c 3/08; C01b 35/00
U.S. Cl. 23—358 4 Claims

The invention relates to the preparation of lithium, sodium and quaternary ammonium cyanoborohydrides. These compounds are prepared by mixing substantially anhydrous hydrogen cyanide with a substantially anhydrous lithium or sodium or quaternary ammonium borohydride at a temperature between 0° C. and 100° C. in a substantially anhydrous solvent, such as tetrahydrofuran, glyme, diglyme, triglyme or dimethyl formamide or mixtures of these at atmospheric pressure. If desired, to avoid loss of hydrogen cyanide, a pressure of from about 1 to 5 pounds per square inch may be used. Preferably, the preparation is carried out in two stages (1) initially at a temperature between about 10° to about 35° C. until substantially all hydrogen has ceased to be

evolved and (2) then at a temperature between about 35° C. and the boiling point of the solvent until all the intermediate products have been converted to the desired cyanoborohydride.

3,667,924

STRESS RELIEVED WELDED STEEL COMPOSITE

William T. De Long and Paul T. Corcoran, West Manchester Township, York County, Pa., assignors to Teledyne Inc., Los Angeles, Calif.

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,320
Int. Cl. B23b *15/00*; B23p *3/00*
U.S. Cl. 29—196.1 1 Claim

A low alloy high strength steel weld deposit of high toughness and superior resistance to thermal degradation and which, after a stress relief consisting of a 16-hour soak at 1025° F. followed by cooling at a rate of 200° F. per hour, has Charpy V-notch impact strength of at least 20. ft.-lbs. at −60° F. at yield strength levels which are selectable between about 90K s.i. and about 145K s.i., the deposit consisting essentially of

Element	Percent by Weight	
	Broad	Preferred
Carbon	[1].12	[1].10
Manganese	.25-.9	.35-.75
Silicon	.20-.70	.25-.55
Chromium	.2-2.0	.2-1.35
Nickel	2.0-4.5	3.0-4.0
Molybdenum	.2-1.2	.35-1.0
Phosphorus	[1].020	[1].012
Sulfur	[1].020	[1].012
Iron	Balance	Balance

[1] Maximum.

also a low alloy steel weld deposit having a yield strength of at least 130K s.i. and Charpy V-notch energy absorption at −60° F. of at least 20 ft.-lbs. after being stress relieved by soaking for 16 hours at 1025° F. followed by cooling at a rate of 200° F. per hour, the deposit consisting essentially of

Element	Percent by Weight		
	Broad	Preferred	Specific example
Carbon	.05-.12	.07-.10	.08
Manganese	.25-.9	.35-.75	.5
Silicon	.20-.70	.25-.55	.4
Chromium	.6-2.0	.75-1.35	1.0
Nickel	2.0-4.5	3.0-4.0	3.5
Molybdenum	.3-1.2	.5-1.0	.75
Phosphorus	[1].020	[1].012	<.01
Sulfur	[1].020	[1].012	<.01
Iron	Balance	Balance	Balance

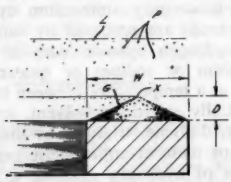
[1] Maximum.

3,667,925

METHOD FOR BONDING WITH DEPOSITED PARTICULATE GLASS

John E. Sheppard, Cornwells Heights, and Vincent J. Pellechia, Lansdale, Pa., assignors to General Instrument Corporation, Newark, N.J.

Filed Feb. 19, 1970, Ser. No. 12,679
Int. Cl. C03c *29/00*
U.S. Cl. 65—43 7 Claims



A process for applying glass to frame-like spacers for glass-sealing the spacers to lids and for thereby closing flat packs. The spacers are submerged in a liquid suspension of enough glass powder to settle such powder onto each spaced in the form of a mound. The base width of the spacer elements determines the depth of the mound. This in turn facilitates accurate dimensioning of the space provided inside the flat pack.

3,667,926

METHOD FOR COATING GLASS

Larry Q. Green, Wilmington, Del., and Larry L. Light, Kinnelon, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 6, 1969, Ser. No. 874,690
Int. Cl. C03c *17/10*
U.S. Cl. 65—60 12 Claims

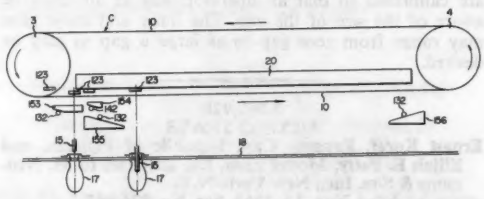
Method of producing scratch resistance on glass by contacting it while hot with (a) an aqueous solution of a water-stable titanium composition and (b) an aqueous dispersion of a surface lubricating composition, the glass temperature being high enough to cause immediate and substantially complete vaporization of the water content of the solution and dispersion.

3,667,927

APPARATUS FOR BLOW MOLDING GLASS BULBS

Takaaki Kurokawa, Chigasaki-shi, Junji Yamada, Odawara-shi, and Makoto Wada, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki-shi, Japan

Filed July 23, 1969, Ser. No. 843,991
Claims priority, application Japan, July 31, 1968, 43/54,077, 43/54,079, 43/54,080
Int. Cl. C03b *9/12*
U.S. Cl. 65—185 13 Claims



An improved apparatus for blowing molding glass bulbs comprising a plate link for conveyor feeding a ribbon of semifused glass, a blow head link conveyor disposed on one side of a running surface of the plate link conveyor and adapted to support a series of blow heads moved in synchronism with the plate links and in the same direction therewith, and a mold link conveyor disposed on the other side of the running surface of the plate link conveyor and adapted to support a series of molds moved in synchronism with the blow heads and in the same direction therewith, said apparatus being provided with pressurizer apparatus for which this invention provides improved blow heads having air blast pipes adapted to blow air into formed bulbs and fed in synchronism with the bulbs and in the same direction as the feed passage of the glass ribbon having bulbs blow-molded between the blow head links and the mold links. Furthermore, there is described herein a structure of the pressurizer heads with improved operating mechanism.

3,667,928

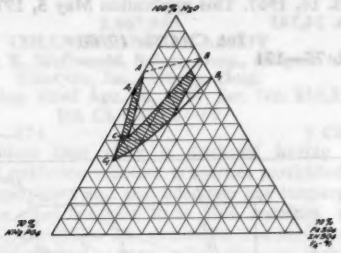
INCREASED COMPONENT CONCENTRATION OF NUTRIENT SOLUTIONS OF TRACE METALS

Peter Stanley Backlund, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Nov. 12, 1969, Ser. No. 875,741
Int. Cl. C05b *7/00*
U.S. Cl. 71—34 6 Claims

A solution suitable for application to plants and soil to correct a plurality of trace metal deficiencies is de-

scribed which comprises an aqueous solution of the sulfate salts of two or more of iron, zinc and manganese together with mono-potassium or mono-ammonium hydro-



gen orthophosphate having an acidic pH value from about 1.5 to about 4, and wherein the components of the solution manifest a mutually increased solubility.

3,667,929

METHOD OF EFFECTING DISSOLUTION OF SOLUTES IN WATER AND COMPOSITIONS THEREFOR

George W. Fleming, Jr., P.O. Box 10372, Charlotte, N.C. 28201

No Drawing. Continuation-in-part of application Ser. No. 382,950, July 15, 1964. This application July 30, 1969, Ser. No. 846,274

Int. Cl. A01n *11/04;* **A61k** *27/00;* **C05c** *5/02*

U.S. Cl. 71—67 **6 Claims**

Aqueous solutions of uniform concentration throughout a vessel are produced without substantial agitation by providing a composition including a solute and an effervescent reaction mixture in finely divided form uniformly coated with a thin film of a slowly dispersible material, whereby upon addition to a vessel of water the mixture effervesces and the gas is entrapped to exert a buoyant effect whereby the bulk of the solute is dissolved in the upper reaches of the vessel and disperses throughout the vessel by gravity, yielding a solution of uniform concentration throughout the vessel. The method and composition therefore find particular utility in the field of veterinary medicines and agricultural chemicals which are employed in the form of aqueous solution.

3,667,930

3-AMINO-5-HALOGENATEDARYLOXYMETHYL-1,2,4-OXADIAZOLES

Herman Breuer, Regensburg, Germany, assignor to Olin Mathieson Chemical Corporation

No Drawing. Application Oct. 9, 1967, Ser. No. 673,977, now Patent No. 3,564,606, dated Feb. 16, 1971, which is a continuation-in-part of application Ser. No. 566,480, July 20, 1966. Divided and this application Dec. 24, 1969, Ser. No. 888,206

Int. Cl. A01n *9/22*

U.S. Cl. 71—92 **6 Claims**

A series of 3-amino-5-halogenatedaryloxymethyl-1,2,4-oxadiazoles are provided by the reaction of selected acyl carbodiimides with hydroxylamine or salts thereof to provide an intermediate N-acylsubstituted-N'-hydroxyguanidine which is converted to the substituted-1,2,4-oxadiazoles by treatment with base. The substituted-1,2,4-oxadiazoles are useful agricultural chemicals, and it has been found that they are particularly outstanding selective herbicides.

3,667,931

BISXANTHATE RICE HERBICIDES

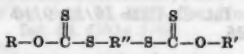
Kenneth L. Viste, Warminster, and Marvin H. Fleischfresser, Warrington, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Jan. 21, 1970, Ser. No. 4,742

Int. Cl. A01n *9/12*

U.S. Cl. 71—102 **9 Claims**

Weeds in rice are controlled by applying a bisxanthate compound of the formula



wherein R and R' are ethyl or n-propyl and R'' is a divalent (C_1–C_4) alkylene radical. The bisxanthates and herbicidal compositions containing them are useful for the control of weeds in both direct seeded and transplanted rice.

3,667,932

METHOD OF MAKING A DISPERSION-HARDENED FERROUS ALLOY

Horace Pops, Edgewood Borough, Pa., assignor to United States Steel Corporation

No Drawing. Filed Aug. 20, 1964, Ser. No. 390,992 The portion of the term of the patent subsequent to Dec. 6, 1987, has been disclaimed

Int. Cl. C21d *1/00*

U.S. Cl. 75—.5 BC **9 Claims**

1. A process for producing dispersion-hardened ferrous alloys comprising making a mixture of ferrous metal and aluminum oxide, randomly distributing said aluminum oxide throughout said ferrous metal by passing induced current supplied by a high-frequency power source through the mixture to melt the metal and stir the mixture and cooling the mixture to produce a solidified body containing a fine dispersion of aluminum oxide.

3,667,933

ROTARY KILN REDUCTION OF IRON OXIDES WITH PNEUMATIC FEEDING OF A PORTION OF THE CHARGE

Guenter Heitmann, Frankfurt-Niederrad, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany, and The Steel Company of Canada Limited, Hamilton, Ontario, Canada, fractional part interest to each

No Drawing. Continuation of application Ser. No. 559,065, June 21, 1966. This application Jan. 12, 1970, Ser. No. 1,952

Claims priority, application Germany, June 23, 1965, M 65,693

Int. Cl. C21b *13/08;* **C22b** *23/02*

U.S. Cl. 75—33 **3 Claims**

Improvements of an ore treating process, wherein the ore and the treating agent are both fed to a rotary kiln which operates at a temperature and pressure sufficient to carry out such treatment, wherein the ore is fed to the treating zone in such a manner that all of it is fed at a given point and that the feeding is carried out under such conditions that the ore being fed is distributed throughout at least a portion of the rotary kiln with the larger particles of ore being deposited the furthest distance from the discharge end of the kiln and the smaller particles, of ore being deposited most proximate to the discharge end of the kiln so that the deposition point of the ore particles distance from the discharge end is proportional to the size of the particles being deposiited, whereby providing a residence time of the particles in the kiln proportional to the size of the particles.

3,667,934

REFINING OF ZINC

Leslie Jack Derham, deceased, late of Avonmouth, England, by Michael Gordon Derham, legal representative, and Glen Owen John, Bristol, England; said John assignor to Imperial Smelting Corporation (Alloys) Limited, London, England

No Drawing. Filed Oct. 15, 1969, Ser. No. 867,120

Claims priority, application Great Britain, Oct. 23, 1968, 50,378/68, 50,379/68, 50,380/68

Int. Cl. C22b *19/32, 9/10*

U.S. Cl. 75—86 8 Claims

Zinc which contains aluminium as an impurity is purified by treating the molten metal with chlorine, in free or combined form, under a molten flux formed from sodium chloride and aluminium chloride.

3,667,935

PROCESS FOR PREPARING NITROGEN-FREE PLATINUM POWDERS

Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 756,394, Aug. 30, 1968. This application Feb. 4, 1971, Ser. No. 112,789

Int. Cl. C22b *11/04*

U.S. Cl. 75—109 1 Claim

Nitrogen-free platinum powders are prepared by precipitation from an aqueous platinum chloride solution, with zinc and hydrochloric acid. This nitrogen-free platinum powder is relatively coarse and can be used in the production of various electrical circuit structures.

3,667,936

DENTAL ALLOY

Michel Katz, Forest Hills, N.Y., assignor to Aurium Research Corporation, New York, N.Y.

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,381

Int. Cl. C22c *5/00*

U.S. Cl. 75—134 N 5 Claims

A precious alloy for use in dental frames on which ceramic coverings are formed by baking. Palladium is used in an amount ranging between 8 and 50 weight percent and indium is used in an amount ranging between 3 and 12 weight percent. The remainder of the alloy consists primarily of gold, or gold and silver, and small amounts of trace metals. With such an alloy, there is no need for the use of platinum as in the prior art dental alloys having the same desirable characteristics.

3,667,937

DENTAL FILLING

Clyde E. Ingersoll, Tonawanda, and Reginald V. Williams, Sr., deceased, late of Buffalo, N.Y., by John A. Williams and Elizabeth P. Williams, executors; said Ingersoll assignor to Williams Gold Refining Incorporated, Buffalo, N.Y.

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,990

Int. Cl. C22c *5/00*; A61k *5/02*

U.S. Cl. 75—165 2 Claims

A metal alloy dental filling consisting of about 99.7 to 99.95 parts pure gold alloyed with about .05 to .30 part calcium is condensed in a prepared tooth cavity. The addition of calcium to pure gold results in a significantly harder filling.

3,667,938

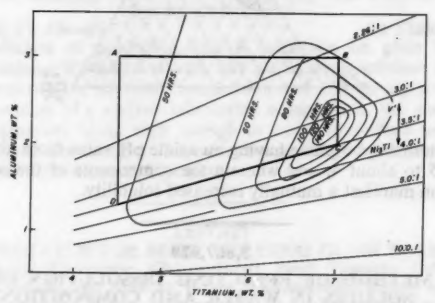
NICKEL BASE ALLOY

William J. Boesch, Utica, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Continuation-in-part of application Ser. No. 675,468, Oct. 16, 1967. This application May 5, 1970, Ser. No. 34,743

Int. Cl. C22c *19/00*

U.S. Cl. 75—171 6 Claims



An alloy consisting essentially of 12 to 20% chromium, 13 to 19% cobalt, 4.5 to about 7% titanium, 1.3 to 3% aluminum, 2 to 3.5% molybdenum, 0.5 to 2.5% tungsten, the combined molybdenum and tungsten content being 3 to 6%, 0.05 to 0.15% carbon, 0.005 to 0.03% boron, the titanium and aluminum content being balanced so as to provide a titanium to aluminum ratio within a specified relationship and a combined titanium and aluminum content of 6.5 to 9%, the balance of the alloy being essentially nickel with up to 0.75% manganese, up to 0.2% yttrium, up to 0.2% other rare earth elements such as cerium or lanthanum and up to 0.5% iron.

3,667,939

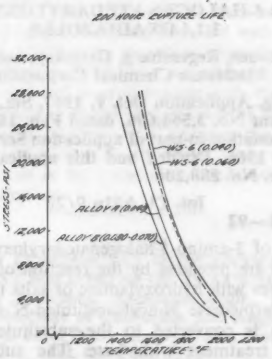
HIGH TEMPERATURE COBALT-BASE SHEET ALLOY

Ralph J. Hecht, West Palm Beach, and Richard J. Fenton, Palm Beach Shores, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 30, 1971, Ser. No. 102,747

Int. Cl. C22c *19/00*

U.S. Cl. 75—171 3 Claims



A superior wrought cobalt-base alloy for high temperature use is provided at the nominal composition, by weight, of 0.9 percent carbon, 25 percent chromium 0.9

percent titanium, 1 percent iron, 15 percent nickel, 7.7 percent tungsten, 0.4 percent zirconium, 1 percent columbium, 2.7 percent tantalum, balance essentially cobalt.

3,667,940
COLUMBIUM BASE ALLOY
William K. McDonald, Salem, Oreg., assignor to Teledyne, Inc., Albany, Oreg.
No Drawing. Filed Apr. 10, 1969, Ser. No. 815,219
Int. Cl. C22c *27/00*
U.S. Cl. 75—174 9 Claims

A columbium base alloy is disclosed having high strength and oxidation resistant properties particularly at elevated temperatures and also adequate low temperature ductility. The alloy contains 20 to 33% hafnium, 11 to 20% tungsten and 0.5 to 2% zirconium, and may contain small amounts of one or more other elements including aluminum, iron, carbon and titanium to modify the properties of the alloy for various applications, and may also contain up to about 4% of tantalum without materially effecting the properties of the alloy except to increase its density.

3,667,941
METALLIC ALLOY FOR BEARINGS
Aldo Dacco', Milan, Italy, assignor to Liasa del Dott. Aldo Dacco', Milan, Italy
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,506
Claims priority, application Italy, Nov. 14, 1968, 23,736/68
Int. Cl. C22c *17/00*
U.S. Cl. 75—178 AC 5 Claims

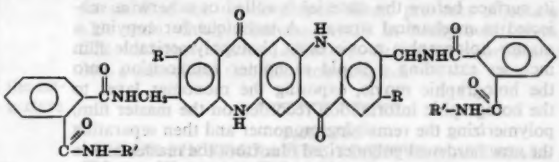
Metallic alloy of the Zn-Al-Cu type, in particular for the manufacture of bearings, comprising 2–8% of electrolytic copper, 12–42% of pure aluminum, the remainder zinc with a high degree of purity, and including an addition of cobalt in the range of 0.02 to 0.35%.

3,667,942
METHOD OF POWDER ROLLING NICKEL-IRON-COBALT ALLOYS
Jerry C. LaPlante, Hempstead, and Thomas A. Poole, Setauket, N.Y., assignors to Alloys Unlimited Inc., Melville, N.Y.
No Drawing. Filed June 9, 1970, Ser. No. 44,854
Int. Cl. B22f *1/00*
U.S. Cl. 75—214 9 Claims

The alloy 29 Ni, 17 Co, balance iron is prepared as a fine powder in the fully annealed condition and is rolled without added binders into a green strip of about 80% density. After sintering at about 1800°–1900° F. for an hour, it is reduced by rolling about 18 to 20%, after which it is resintered. By controlling coil and roll diameters, edge breaking, curling and cracking are prevented. A uniform foil as thin as 0.004 in. can be prepared in this way. The present invention is an improvement over the method described and claimed in my previous U.S. Pat. No. 3,396,015, issued Aug. 6, 1968.

3,667,943
QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING
Lester Weinberger, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
No Drawing. Filed Aug. 22, 1968, Ser. No. 754,726
Int. Cl. G03g *5/06*
U.S. Cl. 96—1 PC 6 Claims

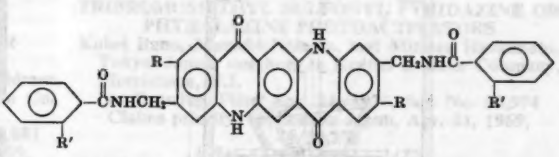
An electrophotographic plate including a photoconductive layer comprising a novel quinacridone pigment in a binder material, said quinacridone pigment having the formula:



wherein R=CH_3, C_2H_5,OCH_3, OC_2H_5 or a halogen and wherein R'=an aromatic, heterocyclic, alicyclic or aliphatic group is disclosed. Methods of preparing said plate and of using said plate in electrophotographic processes are also disclosed.

3,667,944
QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC RECORDING
Lester Weinberger, Brighton, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
No Drawing. Filed Nov. 1, 1968, Ser. No. 772,842
Int. Cl. G03g *5/06*
U.S. Cl. 96—1 PC 6 Claims

An electrophotographic plate including a photoconductive layer comprising a novel quinacridone pigment in a binder material, said quinacridone pigment having the formula:



wherein R=CH_3, C_2H_5, OCH_3, OC_2H_5 or a halogen and wherein R'=COOH, COOCa/2, SO_3H, or $SO_3Ca/2$ is disclosed. Methods of preparing said plate and of using said plate in electrophotographic processes are also disclosed.

3,667,945
QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING
Vsevolod Tulagin, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
No Drawing. Continuation of application Ser. No. 469,143, July 2, 1965. This application June 20, 1969, Ser. No. 842,769
Int. Cl. G03g *5/06*
U.S. Cl. 96—1 PC 9 Claims

An electrophotographic method which employs quinacridone pigments as the photoconductor in the imaging plate.

3,667,946

SURFACE TREATMENT OF PHOTOPOLYMER FILM USED FOR RECORDING HOLOGRAMS

Eugene J. Sturdevant, Wilmington, Del., assignor to Holotron Corporation, Wilmington, Del.

Filed Sept. 23, 1970, Ser. No. 74,590
Int. Cl. G03c 5/12
U.S. Cl. 96—35.1 13 Claims

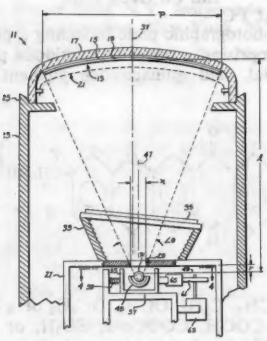
Techniques for treating and handling photopolymer film utilized to record in the visible or near visible range an electromagnetic radiation pattern such as a holographic interference pattern. Prior to exposure of a photopolymerizable film material to the radiation pattern, the film is polymerized at its surface primarily to improve mechanical rigidity of the film. A process of manufacturing elongated photopolymerizable recording film includes extruding a liquid monomer composition onto a substrate and polymerizing the monomer composition at least at its surface before the material is rolled or otherwise subjected to mechanical stresses. A technique for copying a master holographic movie onto photopolymerizable film includes extruding a liquid monomer composition onto the holographic movie, exposing the monomer layer to the holographic information recorded on the master film, polymerizing the remaining monomer and then separating the now hardened polymerized film from the master movie film.

3,667,947

COLOR CRT SCREEN EXPOSURE METHOD

Lefler H. McKee, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Original application Nov. 1, 1967, Ser. No. 679,869, now Patent No. 3,559,546, dated Feb. 2, 1971. Divided and this application Sept. 4, 1970, Ser. No. 69,815
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 6 Claims



A method for light forming a cathode ray tube patterned screen utilizing unattenuated radiant energy of the light source. A photosensitive phosphor-containing coating disposed on the screen panel is exposed, through an adjacently positioned negative mask, by radiant energy of substantially constant intensity from a substantially unattenuated direct light source oriented within an apertured light enclosure. Since the utilized area of the light source is smaller than the discrete aperture area, the light source is moved in a predetermined manner relative to the aperture to effect a simulated light source area equalling the aperture area.

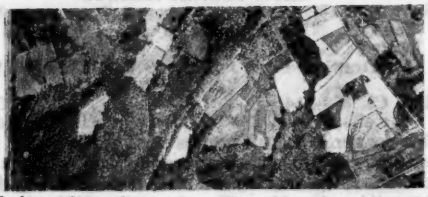
3,667,948

TOPOGRAPHIC MAP AND PROCESS FOR SYMBOLIZING PHOTOGRAPHS

Mylon Merriam, Washington, D.C., assignor to the United States of America as represented by the Secretary of the Army

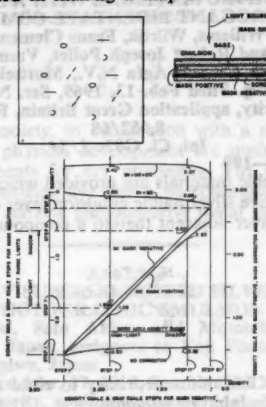
Continuation-in-part of abandoned application Ser. No. 472,371, July 15, 1965. This application June 6, 1969, Ser. No. 831,193
Int. Cl. G03c 5/00; G03f 1/02
U.S. Cl. 96—44 8 Claims

PRIOR ART



This invention relates to a uniform tone image bearing photographic film screen and the method of preparing the

film screen from a photograph. The film screen is subsequently utilized in making a map in which cartographic



symbols are displayed as alterations in the tone of the images from the film screen, while maintaining the texture of the photographic image.

3,667,949

IMAGEWISE PHOTOCHROMIC PROCESS UTILIZING SPIROPYRAN COMPOUNDS AND HALOGENATED HYDROCARBON PHOTOACTIVATORS

Eiichi Inoue, Isamu Shimizu, and Hajime Kobayashi, Tokyo, Japan, assignors to Canon Camera Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Mar. 6, 1969, Ser. No. 805,004
Claims priority, application Japan, Mar. 12, 1968, 43/15,712, 43/15,987
Int. Cl. G03c 1/52
U.S. Cl. 96—48 2 Claims

A stable colored image is obtained by using a spiropyran compound and an ionic compound in a coexistent state, applying image-wise radiation thereto.

The colored state can be eliminated by neutralizing the ionic compound.

Thus, the photochromic image formation can be repeatedly effected.

3,667,950

BLEACH-FIXING SOLUTION FOR COLOR PHOTOGRAPHY

Hiroyuki Amano, Haruhiko Iwano, and Kazuo Shirasu, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,881
Claims priority, application Japan, Dec. 16, 1969, 44/101,115
Int. Cl. G03c 5/32
U.S. Cl. 96—60 12 Claims

A single bleach-fixing solution for color photographic light-sensitive materials comprising a ferricyanide and a thiocyanate and containing at least one compound having an aldehyde group or a methylol group is disclosed.

3,667,951

PHOTOGRAPHIC STABILIZING BATHS INHIBITED AGAINST CORROSION WITH POLYALKYLENE GLYCOLS

Henry J. Fassbender and Nelson S. Case, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 3, 1969, Ser. No. 803,937
Int. Cl. G03c 5/38
U.S. Cl. 96—61 15 Claims

Stabilizing baths which are utilized in rapid access processing of photographic elements and which comprise a thiocyanate stabilizing agent and an aluminum salt which functions as a hardening agent for photographic emulsion are rendered less corrosive to processing equipment by incorporation therein of a minor amount of a polyalkylene glycol.

3,667,952

COLOR STABILIZATION PROCESSING

Henry J. Fassbender, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 6, 1969, Ser. No. 864,177
Int. Cl. G03c 5/38, 7/30
U.S. Cl. 96—61 5 Claims

The use of carbonyl-bisulfite adducts, e.g., formaldehyde bisulfite, in color stabilization processes which involve treating an imagewise exposed, incorporated coupler, multilayer, silver halide sensitized photographic element in a developer to form silver and color images and then treating the developed element with a thiosulfate stabilizer to stabilize the nondeveloped silver, prevents objectionable stain which otherwise results in background areas. The carbonyl-bisulfite adduct is desirably incorporated into a thiosulfate stabilizer composition.

3,667,953

COLOR PHOTOGRAPHIC POSITIVE MATERIALS

Shigeru Watanabe, Yukio Yasuda, and Kazuya Sano, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1970, Ser. No. 22,468
Claims priority, application Japan, Oct. 9, 1969, 44/80,987
Int. Cl. G03c 1/76
U.S. Cl. 96—74 7 Claims

Multi-layer color photographic light-sensitive positive material incorporating, in addition to cyan, magenta and yellow dyes in the light-sensitive emulsion layers thereof, at least one of a red or blue dye-forming coupler capable of forming a dye or dyes having absorption maximums at 460–520 nm. and 570–640 nm., respectively. Such red and blue dye couplers are selected such that the dyes are formed selectively in high density images areas and result in the production of images possessing excellent reproduction of both colors and black.

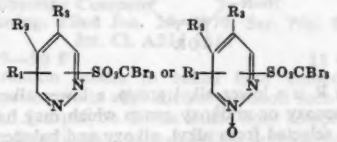
3,667,954

TRIBROMOMETHYL SULFONYL PYRIDAZINE OR PHTHALAZINE PHOTOACTIVATORS

Kohei Itano, Masashi Nakano, and Mitsuru Hashimoto, Tokyo, Japan, assignors to Keuffel & Esser Company, Morristown, N.J.

No Drawing. Filed Apr. 22, 1970, Ser. No. 30,974
Claims priority, application Japan, Apr. 21, 1969, 44/30,278
Int. Cl. G03c 1/52, 1/72
U.S. Cl. 96—90 6 Claims

A light-sensitive printing material comprising a photoactivator capable of forming a free radical by action of light and a discoloring agent showing a visible color change by action of said free radical, characterized by using as the photo-activator a pyridazine or phthalazine derivative which is represented by the general formula



wherein R_1, R_2 and R_3 are individually a hydrogen atom, a hydroxy group, a lower alkyl group, an alkylsulfonyl

group, an alkoxy group or an alkoxycarbonyl group, provided that R_2 and R_3 may form a benzene ring and, in the case of an N-oxide type compound, R_3 may be a tribromomethyl sulfonyl group.

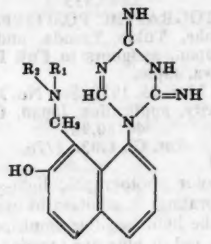
3,667,955

TWO-COMPONENT DIAZOTYPE PHOTOSENSITIVE MATERIAL

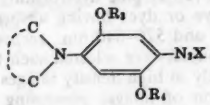
Shigeaki Yoshida, Yokohama-shi, Kanagawa-ken, and Tadashi Saito, Kawasaki-shi, Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

No Drawing. Filed June 6, 1969, Ser. No. 831,202
Claims priority, application Japan, June 15, 1968, 43/41,288
Int. Cl. G03c *1/58, 1/54*
U.S. Cl. 96—91 R 8 Claims

Two-component diazotype photosensitive material containing a coupling component of the following general Formula 1 and a diazocompound of the following general Formula 2 gives a navy blue or dark blue dye-image having high density and fastness by developing in an alkaline solution or vapor.



(1)



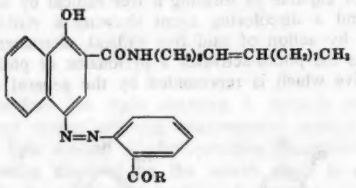
(2)

3,667,956

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING CYAN COUPLERS

No Drawing. Filed Feb. 18, 1970, Ser. No. 12,476
Claims priority, application Japan, Feb. 24, 1969, 44/13,216
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 4 Claims

A compound of the general formula



wherein R is a lower alkyl group, a lower alkoxy group, or a phenoxy or aralkoxy group which may have a substituent selected from alkyl, alkoxy and halogen is found to be useful as a cyan coupler providing auto-masking mechanism for light-sensitive color photographic materials so as to compensate the deficient color reproductivity of said materials.

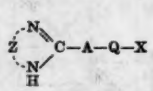
3,667,957

PHOTOGRAPHIC MATERIAL WITH A STABILIZER ANTIFOGGANT BIDENTATE COMPOUND

Jozef Frans Willems, Wilrijk, Frans Clement Heugebaert, Kontich, and Robert Joseph Pollet, Vremde, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,097
Claims priority, application Great Britain, Feb. 22, 1968, 8,652/68
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 7 Claims

Photographic materials are provided which comprise in a light-sensitive silver halide emulsion layer or in a water-permeable layer adjacent thereto a compound of the formula:



wherein:

Z represents the atoms necessary to close a heterocycle,
Q stands for sulphur or selenium,
A stands for alkylene which may be interrupted by one or more hetero atoms, S-alkylene which may be interrupted by one or more hetero atoms, or arylene,
X stands for alkyl, alkenyl or aryl, or
A and X together represent the atoms necessary to complete a saturated heterocycle,

the said compound comprising directly or indirectly linked to the group Z and/or X a —COOM or —SO_3M group wherein M is hydrogen, ammonium, a metal atom or organic ammonium. These materials have reduced fogging tendency, even under conditions of high humidity and heat, and their sensitivity is substantially unaffected by the presence of the aforesaid compound.

3,667,958

PHOTOSENSITIVE AND THERMOSENSITIVE ELEMENTS, COMPOSITIONS AND PROCESSES

Francis J. Evans, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,105
Int. Cl. G03c *1/02*
U.S. Cl. 96—114.1 27 Claims

A reducing agent combination of a polyhydroxybenzene reducing agent with a reducing agent which is a hydroxylamine, a reductone and/or a hydrazine, in a photosensitive and thermosensitive element, composition and/or process employing an oxidation-reduction image forming combination provides greater image discrimination or resolution, with an increase in relative speed and improved black tone. Such a reducing agent combination can be employed in an image reproduction sheet in which a radiation sensitive heavy metal salt can be reduced to free metal and form the image components in an oxidation reduction reaction combination by producing a visible color change with an organic silver salt.

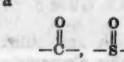
3,667,959

PHOTOSENSITIVE AND THERMOSENSITIVE ELEMENT, COMPOSITIONS AND PROCESS

Stanley M. Bojara and Richard A. de Mauriac, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 1, 1970, Ser. No. 33,966
Int. Cl. G03c *1/02*
U.S. Cl. 96—114.1 27 Claims

A non-aqueous, polar, organic solvent, such as a compound containing a



or —SO_2— moiety, in a photosensitive and thermosensitive element suitable for dry processing with heat, provides

improved maximum image densities and reduced exposure and processing time in some cases. A combination of a non-aqueous, polar, organic compound, such as one containing a

or —SO_2— moiety, in conjunction with a stable source of silver for physical development are useful in photosensitive elements for dry processing. The element can contain a sensitizing dye and a photosensitive silver halide, or other suitable photosensitive metal salts.

3,667,960

SPECTRALLY SUPERSENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba, Sato Akira, and Motohiko Tsubota, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1970, Ser. No. 23,122
Claims priority, application Japan, Mar. 27, 1969, 44/23,320
Int. Cl. G03c *1/14*
U.S. Cl. 96—124 **15 Claims**

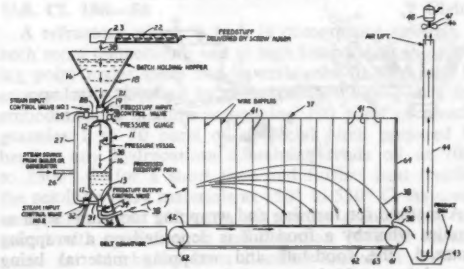
Supersensitization of silver halide photographic emulsions by employing a combination of specific sensitizing dyes, one containing a heterocyclic nucleus selected from the group consisting of naphthoselenazole and naphthoxazole and the other of which containing a 2-quinoline nucleus. The particular combination of spectral sensitizing dyes employed provide a high degree of supersensitization over the entire visible range.

3,667,961

PROCESS FOR IMPROVING DIGESTIBILITY OF FEEDSTUFFS FOR RUMINANT ANIMALS

John W. Algeo, Santa Ynez, Calif., assignor to Santa Ynez Research Farm, Santa Ynez, Calif.

Filed Sept. 22, 1967, Ser. No. 674,050
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 R **22 Claims**



The invention comprises a rapid process and relatively economical equipment for increasing nutrient availability of ruminant animal feedstuffs, which includes the irreversible rearrangement of initial molecular bond structures of such feedstuffs to different molecular bond structures with concomitant degradation of relatively indigestible molecular structures to shorter chain length more digestible carbohydrates by subjecting ruminant animal feedstuffs in a closed vessel to high pressure steam for relative short time intervals and thereafter rapidly releasing the thus subjected feedstuffs to atmospheric conditions, together with means for successively collecting and storing the thus subjected feedstuffs, and which also includes reducing in the ingested resulting feedstuffs of the proportion of acetic acid in the rumen while increasing the total steam volatile fatty acid output by the rumen microflora.

3,667,962

CARBONATED DRINK BASE FOR MAKING CARBONATED BEVERAGES BY ADDITION TO WATER

Edward L. Fritzberg, Minneapolis, Minn., and Donald C. Fellenz, Westfield, N.Y., assignors to The Pillsbury Company, Minneapolis, Minn.

No Drawing. Filed July 14, 1969, Ser. No. 841,613
Int. Cl. A23l *1/26*
U.S. Cl. 99—78 **9 Claims**

A dried base which forms a carbonated beverage when added to water. The base consists of two porous friable bodies, one containing a soluble, thermoplastic, amorphous saccharide and an edible acid, the other a soluble, thermoplastic, amorphous saccharide and an edible carbonate which will react with the acid when placed in water to evolve carbon dioxide. Premature reaction between acid and carbonate is prevented by their physical separation.

3,667,963

METHOD OF MAKING PIZZA

Raymond G. Katter, 2833 Banbury Road, and Joseph L. Katter, 6818 South 2030 East, both of Salt Lake City, Utah 84121

Filed Dec. 17, 1969, Ser. No. 885,750
Int. Cl. A21d *13/00*
U.S. Cl. 99—86 **6 Claims**

A pizza or similar food product is prepared by slicing a baked roll, applying a sealing layer of margarine to the soft interior surface of the roll, applying a liquid sauce over the sealing layer, and baking the resulting combination.

3,667,964

ESTERS OF 1,3 DIOLS AND 1,3,5 x-POLYOLS AS ADDITIVES FOR BAKED GOODS

John W. Frankenfeld, Atlantic Highlands, N.J., and Marcus Karel, Newtonville, and Theodore P. Labuza, North Tewksbury, Mass., assignors to Esso Research and Engineering Company

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,796
Int. Cl. A21d *2/16*
U.S. Cl. 99—90 P **10 Claims**

Baked food additives which comprise certain esters of polyalcohols, such as esters of 1,3-diols and 1,3,5 x-polyols, are excellent dough conditioners, anti-staling agents and preservatives. The present invention is concerned generally with high quality baked food compositions and is more specifically concerned with additive materials for addition to baked foods, which materials comprise particular esters of particular diols and polyols.

3,667,965

BAKED FLOUR COMPOSITIONS CONTAINING ALIPHATIC DIOLS

John W. Frankenfeld, Atlantic Highlands, N.J., and Marcus Karel, Newtonville, and Theodore P. Labuza, North Tewksbury, Mass., assignors to Esso Research and Engineering Company

No Drawing. Filed Jan. 20, 1970, Ser. No. 4,427
Int. Cl. A21d *2/14*
U.S. Cl. 99—90 P **11 Claims**

This invention relates to baked flour compositions which comprise certain aliphatic polyalcohols such as 1,3-diols and 1,3,5, x-polyols. These baked flour compositions containing aliphatic diols have excellent anti-staling properties and greatly improved storage properties due to mold inhibition. In addition, since they are energy dense compounds which are rapidly and completely metabolized, they improve the nutritional qualities of the product.

3,667,966
YEAST RAISED BAKED PRODUCTS AND PREPARATION THEREOF

Albert Peter Centolella, Edwardsburg, Mich., and Billy Gene Razor, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

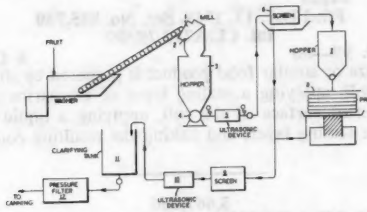
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,712
Int. Cl. A21d 2/14
U.S. Cl. 99—91 12 Claims

A yeast raised baked product and a method for preparing such a baked product utilizing a dough additive comprising a polyester of citric acid and sorbitol which imparts improved characteristics to the dough and the baked product resulting therefrom.

3,667,967
PROCESS FOR IMPROVED APPLE JUICE EXTRACTION

Michael L. Coltart, Winfield, British Columbia, and David Paton, Kelowna, British Columbia, Canada, assignors to Sun-Rype Products Ltd., Kelowna, British Columbia, Canada

Filed Apr. 1, 1969, Ser. No. 811,794
Claims priority, application Canada, Dec. 6, 1968, 37,047
Int. Cl. A23l 1/02, 3/30
U.S. Cl. 99—105 5 Claims



A process and apparatus for improving the yield of juice which may be extracted from a vegetable or fruit pulp. The process subjects the pulp to ultrasonic vibrations in the frequency range between 20 and 300 kc/s at a sound intensity of up to about 20 watts/sq. cm. It has also been found advantageous to treat expressed juice, which has been produced by ultrasonic means or otherwise, with ultrasonic vibrations, in order to improve the quality and filterability of the juice. Although ultrasonic vibrations may be generated in many ways it has been found particularly suitable to employ a sonic whistle which may be placed in line in continuous production equipment.

3,667,968
CHEESE FLAVORS

Robert L. Kasik, Oak Lawn, and Anthony J. Luksas, Chicago, Ill., assignors to Beatrice Foods Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 824,250, May 13, 1969. This application May 13, 1969, Ser. No. 824,259
Int. Cl. A23c 19/02, 19/12; A23l 1/26
U.S. Cl. 99—140 R 34 Claims

Cheese flavors and cheese flavored products are produced in a short time by growing a combination of one member of the genus Bacillus and one member of the genus Streptococcus in an aqueous medium containing a protein and a carbohydrate to produce a ferment. The resulting ferment is inoculated with specific cheese flavor organisms such as *Penicillium roquefortii* and further fermented. The product is then formed into a cheese or dried to a powder, as desired.

3,667,969
ARTIFICIAL SWEETENING COMPOSITION

Paul Kracauer, New York, N.Y., assignor to American Sweetener Corp., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 808,984, Mar. 20, 1969. This application Sept. 28, 1970, Ser. No. 76,216
Int. Cl. A23l 1/26
U.S. Cl. 99—141 A 10 Claims

The bitter after-taste characteristic of artificial sweetening compositions is eliminated by a composition comprising a major amount of saccharin and minor amounts of d-galactose. The flavor of the sweetening composition may be further improved by the addition of small amounts of sodium chloride and/or calcium hydroxide.

3,667,970
PROCESS FOR PRESERVING MEAT

Juergen Scheide, Holzminden, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

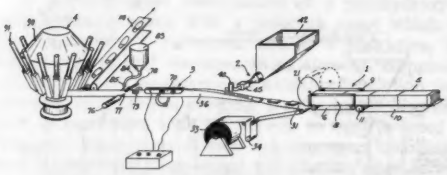
No Drawing. Continuation-in-part of abandoned applications Ser. No. 822,290 and Ser. No. 822,291, both May 6, 1969. This application June 3, 1971, Ser. No. 149,813
Claims priority, application Germany, May 10, 1968, P 17 67 438.3, P 17 67 439.4
Int. Cl. A23b 1/00, 3/00
U.S. Cl. 99—169 9 Claims

The surface of fresh meat is treated with a mixture of from 2–30% by weight of a monoglyceride and from 98–70% by weight of a di- or triglyceride of paraffinic or olefinic carboxylic acids with from 8–22 carbon atoms to form a coherent film over the meat surface to improve the storageability and quality of the meat.

3,667,971
METHOD OF FORMING AND WRAPPING FOODSTUFFS

Fred William Brunner, Eugene, Oreg., assignor to Manning's Inc., San Francisco, Calif.

Filed July 13, 1970, Ser. No. 54,115
Int. Cl. B65b 25/06
U.S. Cl. 99—171 R 6 Claims



A method for forming and wrapping foodstuffs such as tamales whereby a foodstuff is deposited on a wrapping material, the foodstuff and wrapping material being formed into a U-shape and then heat sealed across the upwardly extending edges after depositing filling material into the foodstuff. The wrapping material is then heat sealed between adjoining foodstuffs.

3,667,972
CHEMICAL NICKEL PLATING BATHS

Miguel Coll-Palagos, Rye, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 687,470, Dec. 4, 1967. This application June 11, 1970, Ser. No. 48,836
Int. Cl. C23c 3/02
U.S. Cl. 106—1 8 Claims

Acidic electroless plating solution comprising nickel ions, hypophosphite ions, and an ion of the group of

sulfamate, fluoborate and mixtures thereof for improved solution stability and providing electroless plates characterized by lower internal stresses so as to provide improved adhesion. Stability is further improved by the addition of glycolate ions and acetate ions. Boric acid is used to further improve characteristics of the plating bath.

3,667,973

SPONTANEOUS FLUORIDE OPAL GLASSES WITH THERMALLY REVERSIBLE OPACITY

James E. Flannery, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,501
Int. Cl. C03c *3/04*
U.S. Cl. 106—54 2 Claims

This invention relates to the manufacture of spontaneous alkali metal fluoride opal glasses containing opacity densifying agents and exhibiting thermally reversible opacity; that is, they may be heated to clearness and cooled to opacity without deformation of the glass being heated. Operative compositions include glasses consisting essentially, by weight on the oxide basis, of 70–80% SiO_2, 1–3% Al_2O_3, 7–14% B_2O_3, 1.5–4% Li_2O, 0–10% R_2O, wherein R_2O is at least one alkali metal oxide selected from the group consisting of K_2O and Na_2O, 3–6% F, and a total of 1–3% of an opacity densifying agent selected from the group consisting of MoO_3, WO_3, and As_2O_3.

3,667,974

PROCESS FOR PREPARING A MOLDED PITCH-POWDER GRANULE SYSTEM WITH AN IMPROVED BONDING MATERIAL AND PRODUCTION PRODUCED THEREFROM

Kaoru Umeya, Sendai-shi, Akira Watanabe, Okayama, and Shinpei Gomi, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, and Kyushu Taika Renga Kabushiki Kaisha, Okayama, Japan

No Drawing. Filed June 12, 1969, Ser. No. 832,812
Claims priority, application Japan, June 12, 1968, 43/39,898
Int. Cl. C04b *35/02, 35/04*
U.S. Cl. 106—58 7 Claims

A refractory which is high in compressive strength at both room temperature and at high temperatues in softening point under load, and in resistance to slags can be economically obtained by compression molding as a first embodiment a mixture comprising 100 parts of powder granules 1 to 30 parts of a special pitch prepared by heating any hydrocarbon containing crude oil at 700° to 2300° C. for a short time and further heat treating the resulting tarry materials at 150° to 550° C. As a second embodiment 100 parts of powder granules are admixed with special pitch and less than 70% of an aromatic tar which has been likewise heated at 700° to 230° C. for a short time, and then further heated at 150° to 550° C.

3,667,975

EXTRUDABLE REFRACTORY FIBROUS MATERIAL

Dwight Maxwell Teague, Birmingham, William F. Bertrand, St. Clair Shores, Philip J. Willson, Royal Oak, and Frank E. Ammermann, Ann Arbor, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,900
Int. Cl. C04b *35/10*
U.S. Cl. 106—65 4 Claims

A refractory fibrous product composed of refractory fibers coated with a lubricating layer of aluminum metahydroxide whereby the coated fibers form an injectable and extrudable paste, and process for producing same.

ERRATUM

For Class 106—90 see:
Patent No. 3,668,150

3,667,976

COLORED CEMENT

Theodore F. Tanner, Houston, Tex., assignor to General Portland Cement Co., Dallas, Tex.

No Drawing. Filed June 30, 1970, Ser. No. 51,361
Int. Cl. C04b *7/10*
U.S. Cl. 106—97 17 Claims

Cement, and particularly portland cement, can be colored to a variety of different hues by admixing selected metals with the raw materials from which the cement is made prior to or during burning of the raw materials. The metals can be introduced in elemental or combined form. Generally, the metals are introduced in amounts from 0.2 to 2.0% by weight expressed as the oxide of the metal based on the total amount of dry raw materials which are introduced into the kiln. Burning temperatures at which the raw materials and coloring agent are reacted are conventional.

3,667,977

EXPLOSION-PROOF ASBESTOS-CEMENT SHAPES

James E. Harbison, Ambler, Pa., assignor to Certain-Teed Products Corporation, Ardmore, Pa.

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,423
Int. Cl. C04b *31/08*
U.S. Cl. 106—99 3 Claims

Asbestos-cement shapes are formed from a furnish containing a small quantity of vegetable fibers distributed therein, the shapes being formed by screw extrusion, thereby providing articles or shapes in which fibers extend randomly from the exterior surface of the shapes into the interior regions thereof and thus provide "bleed" channels through which vapor formed in the interior may escape when the shapes are subjected to heating, with consequent substantial elimination of tendency to explode.

3,667,978

LIGHT-WEIGHT HIGH-STRENGTH CEMENT COMPOSITIONS

Anatole N. Vassilevsky, deceased, late of West Haven, Conn., by Irene Vassilevsky, executrix, West Haven, Conn., and Adolf Renke, Lincolndale, N.Y.; Said Irene Vassilevsky assignor to V.R.B. Associates, Inc., Lincolndale, N.Y.

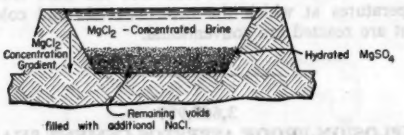
No Drawing. Continuation-in-part of application Ser. No. 570,743, Aug. 8, 1966, which is a continuation-in-part of application Ser. No. 306,702, Sept. 5, 1963. This application May 26, 1969, Ser. No. 829,158
Int. Cl. C04b *7/00, 9/00, 9/14*
U.S. Cl. 106—105 4 Claims

A hydraulic cement binder consisting of magnesium oxide, magnesium sulfate and calcium chloride in proportion such that a magnesium oxychloride/magnesium oxysulfate/calcium sulfate hardenable mass is produced upon addition of water and setting. The binder is combined with organic matter which is treated to partially hydrolyze the cellulosic material and thereafter neutralize it. For decreased brittleness and increased waterproofing characteristics, the binder contains sodium silicate and silicofluoride.

3,667,979
INVESTMENT CASTING WAX
John C. Merges, Jr., Glen Mills, and Richard E. Ware, Trainer, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Apr. 30, 1971, Ser. No. 139,243
Int. Cl. C08h *9/10*
U.S. Cl. 106—268 16 Claims

An improved investment casting wax composition consisting essentially of about 35–65 weight percent refined petroleum wax, solid chloronated polyphenyl, acid type montan wax and stearic acid. Said composition has the advantage of low shrinkage, low penetration and rapid set up.

3,667,980
STRONG SALT FLOOR COMPRISING HALITE CRYSTALS, MAGNESIUM SULFATE AND POTASSIUM
Ulrich E. G. Neitzel and David S. Butts, Ogden, Utah, assignors to Great Salt Lake Minerals & Chemicals Corporation, New York, N.Y.
Filed Sept. 24, 1968, Ser. No. 761,961
Int. Cl. C08h *17/24*
U.S. Cl. 106—286 10 Claims



A reinforced, sodium chloride floor for a solar pond is developed. First, a brine is evaporated under conditions which deposit a sodium chloride layer, containing a high volume-percent of voids, on the pond bottom. The sodium chloride layer is then covered with brines of preselected compositions such that first hydrated magnesium sulfate and then additional sodium chloride is deposited in the voids. There results a floor which is stronger and more compact than sodium chloride floors developed by prior art methods.

3,667,981
UPGRADED CAST REFRACTORY PRODUCTS
Marc Roland Gilbert Esnoult, Le Pontet, and Michel Louis Ayme-Jouve, Sorgues, France, assignor to L'Electro-Refractaire, Paris, France
No Drawing. Filed Dec. 23, 1969, Ser. No. 887,774
Claims priority, application France, Dec. 27, 1968, 181,380
Int. Cl. E04g *23/02, 21/00*
U.S. Cl. 117—2 R 6 Claims

The invention relates to cast refractory products having dispersed shrinkage cavities or voids, these products being characterized in that said cavities or voids are filled with a suitable grout comprising powdered refractory materials.

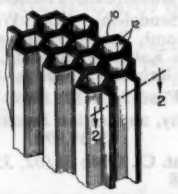
3,667,982
PLASTICS COATED MATERIAL
Edwards Bukalders, Barnsley, England, assignor to Bukflex Processes Limited, Barnsley, England
No Drawing. Filed June 29, 1970, Ser. No. 50,912
Int. Cl. B44c *1/02, 5/00*
U.S. Cl. 117—10 11 Claims

The invention comprises a method of producing a grained effect on the face of a layer of thermoplastic material coated on to a sheet of pliable carrier material, in which a protective film is applied to the surface of said layer, and the material is tumbled or crumbled to distort the layer to produce the grained effect.

3,667,983
FLEXIBLE COLOUR PRINTED LAMINATE AND METHOD OF MAKING SAME
Robert H. Haggas, 9 Southway, Eldwick, and John S. Haggas, 4 Stoney Ridge, Cottingley, both of Bingley, England
No Drawing. Continuation-in-part of application Ser. No. 626,937, Mar. 30, 1967. This application Dec. 4, 1969, Ser. No. 882,275
Claims priority, application Great Britain, Apr. 7, 1966, 15,551/66
Int. Cl. B44d *1/32;* B44m *1/24*
U.S. Cl. 117—15 8 Claims

A colour printing process which enables conventional lithographic and letterpress inks and techniques to be employed for printing on classes of flexible thermoplastic sheet material, to which such inks, being polymerisable, do not normally adhere readily, so as to provide a durable print. The problem of obtaining an enduring bond between such inks and base sheet, is overcome by the use of a synthetic lacquer which permeates the printwork and serves both as a bonding agent and as a protective coating. The resulting colour prints are more delicate than those produced by the silk screen process which has hitherto normally been used for such base materials.

3,667,984
COATED POROUS STRUCTURES AND METHOD FOR FORMING THEM
Whitney R. Adams, Wilmington, Del., assignor to Scott Paper Company, Delaware County, Pa.
Application Aug. 16, 1968, Ser. No. 756,344, which is a continuation-in-part of application Ser. No. 491,612, Sept. 30, 1965. Divided and this application July 14, 1969, Ser. No. 870,692
Int. Cl. B44d *1/094*
U.S. Cl. 117—21 11 Claims

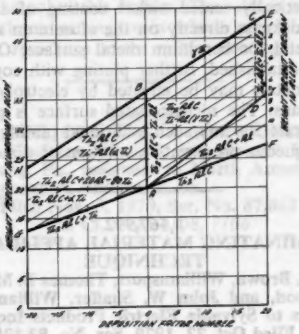


Porous structures such as cellular honeycombs and reticulated foams coated wtih organic resins of the thermoplastic or thermosetting type, and structures in which the internal material comprising the structure being coated is removed as by leaching or hydrolysis to leave only the coating material as an integral structure. Processes for forming the above structures in which the surface of the porous structure is treated to temporarily attach a coating material in the form of powder, as by wetting the surface with a liquid or an adhesive and dusting the surface with the powder, heated to melt the powder into a smooth contiguous coating, and, in some instances, subjected to hydrolysis to remove the material comprising the original structure being coated so as to leave only the structure formed by the coating material.

3,667,985
METALLIC SURFACE TREATMENT METHOD
David J. Levine and Moses A. Levinstein, Cincinnati, Ohio, assignors to General Electric Company
Original application Dec. 14, 1967, Ser. No. 693,691, now Patent No. 3,540,878. Divided and this application Apr. 23, 1970, Ser. No. 43,289
Int. Cl. B44d *1/094, 1/34*
U.S. Cl. 117—22 4 Claims

The metallic powder produced from a ternary alloy of Ti, Al and C, having a dispersion of Ti_2AlC complex carbide in a matrix of Ti or Al or their alloys, preferably the

binary Ti_2Al with the Ti within the gamma range of the Ti-Al phase diagram and avoiding detrimental amounts of $TiAl_3$, allows accurate control of the deposition of



either or both Al and Ti or their alloys in a diffusion pack-type method for coating an article. Deposition is brought about through the use of a halide salt activator preferably in the fluoride or chloride class.

3,667,986

OPAQUE COMPOSITION FOR FORMING A WINDOWED WEB IN A CATHODE RAY TUBE SCREEN STRUCTURE

Robert A. Hedler, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

No Drawing. Filed May 28, 1970, Ser. No. 41,530
Int. Cl. B44d *1/02, 5/00*; C03c *17/00*
U.S. Cl. 117—33.5 CM **5 Claims**

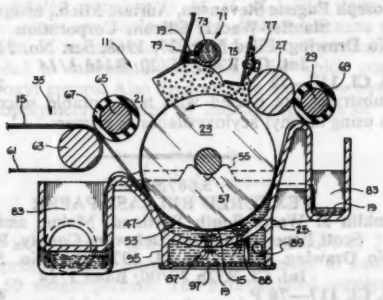
An improved opaque composition which is formulated to be utilized in a minimal step process for forming a uniform opaque interstitial pattern for a color cathode ray tube screen structure. The opaque composition, containing a high percentage of an organic solvent, is disposed in a manner to form an opaque interstitial web having multitudinous windows therein wherein phosphor pattern elements are subsequently disposed.

3,667,987

METHOD OF DEVELOPING LATENT ELECTROSTATIC IMAGES

George J. Miller, Skokie, Ill., assignor to SCM Corporation, New York, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,393
Int. Cl. G03g *13/10, 15/10*
U.S. Cl. 117—37 LE **6 Claims**



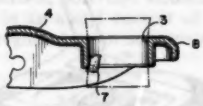
A latent electrostatic image on a surface of a carrier is developed into a visible image by moving the carrier along a developing path with the image-bearing surface contacting a developing liquid in effective field control spacing with an electrically conductive surface of an image intensifier moving along the developing path. Developing liquid is supplied to the surface of the image intensifier by a porous wiper wetted with developing liquid, and an incoming image-bearing carrier is guided along the developing path in contact with the developing liquid by ridges extending along the developing path on an upwardly concave wall which forms a trough through which the image intensifier moves. As the carrier moves through the developing trough, the image-bearing surface is pressed into effective field control spacing with the image intensifier over an elongated distance of the developing path by developing liquid which is received into a chamber and directed against the back side of the carrier by orifices formed in the upwardly concave wall. After passing through the trough, the carrier is guided through a pair of cooperating squeegee rollers which remove excess developing liquid from the carrier.

3,667,988

MASKING IN SURFACE TREATMENT OF ARTICLES

Seinosuke Horiki, Nagoya-shi, Japan, assignor to Nagoya Yukagaku-Kogyo Kabushiki Kaisha, Takai-shi, Aichi-ken, Japan

Filed June 30, 1970, Ser. No. 51,141
Claims priority, application Japan, July 9, 1969, 44/54,378; May 25, 1970, 45/44,692
Int. Cl. B44d *1/02, 1/52*
U.S. Cl. 117—38 **6 Claims**



A method of masking for protecting a specified area of surface of articles from coating or plating characterized in that protecting elements made of synthetic resin foam in the shape of a column, doughnut, ball, truncated cylinder, prism, cube, cap or ring are used and wherein said synthetic resin foam is stable and restrains elasticity at normal temperature, but when heated above a predetermined temperature rapidly contracts in its volume, thereby said area being effectively masked during coating or plating and during heat-treatment of the coated or plated article the protecting element is contracted in volume and freely removed from the article.

3,667,989

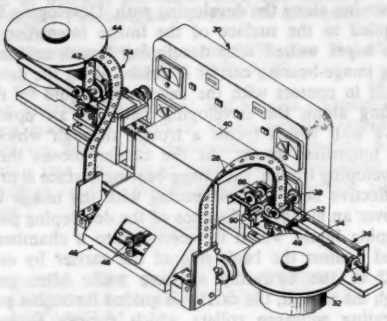
METHOD FOR SELECTIVELY COATING ARTICLES

John M. Keating, Muhlenberg Park, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Original application Dec. 26, 1968, Ser. No. 787,040, now Patent No. 3,587,524, dated June 28, 1971. Divided and this application Aug. 6, 1970, Ser. No. 61,786
Int. Cl. B44d *1/18, 1/52*
U.S. Cl. 117—38 **3 Claims**

Articles to be selectively coated, are conveyed through a coating station by a tape which serves also to mask areas of the articles where coating is not desired. The tape is in the form of an endless belt and coating material is continuously removed from the tape so that each article to be coated is presented with a cleaned portion of the tape as a mask. Automatic apparatus is provided to al-

ternately raise and lower sections of the tape over a support track for the articles in coordination with feeding and accumulating devices to bring parts into and out of engagement with the tape.



3,667,990

PRODUCTION OF INDICIA UPON SURFACE

Murray K. Rogers, deceased, late of Somerset, Ky., by May B. Rogers, executrix, Somerset, Ky., assignor to Mi-Marker Corporation, Ferguson, Ky.

Filed June 18, 1969, Ser. No. 834,620
Int. Cl. B05c *1/16, 5/00;* B44d *1/09, 1/52*
U.S. Cl. 117—38 8 Claims

A stenciling system including method and apparatus for marking indicia on a surface wherein the dispensing nozzle of a flexible tube of marking material is applied directly to said surface while being guided by said stencil. Regulation of the flow of ink is accomplished through manual pressure on the sides of the tube. A stencil assembly is disclosed having a unitary frame with bent-over edges to hold individual stencil members in position to form a composite display. A package is included in the kit for storing two stencils and two tubes of ink, said stencils bisecting the package to form compartments for the tubes.

3,667,991

PROCESSES FOR NICKEL PLATING METALS

George A. Miller, South Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,014
Int. Cl. B44d *1/092;* C23c *3/02*
U.S. Cl. 117—50 8 Claims

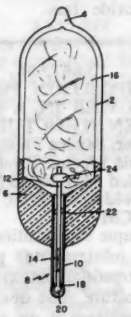
Aluminum metals having nickel coatings plated directly thereon may be prepared by electroless deposition of nickel from an aqueous plating solution containing nickel ions, dimethylaminoborane, a carboxylic acid complexing agent and a stress reducer. Nickel plated magnesium metals and beryllium metals may be similarly prepared. The metal surface is rendered susceptible to plating by initially contacting it with a novel activating solution containing ammonium bifluoride and either dimethylaminoborane or nitric acid, and then rinsing if nitric acid is used. Where dimethylaminoborane is used in the activating solution, the metal surface is thereafter stabilized with an aqueous stabilizing solution of dimethylaminoborane. Electroless plating is then carried out, producing a stress free hermetically sealed nickel coating of substantially uniform thickness directly on the aluminum metal, magnesium metal, or beryllium metal surface. Once such a coating is established, further plating with copper, nickel or other metals may be effected by electrolytic or electroless means. The nickel coated surface is preserved in a proper state for any such additional plating by holding it in an aqueous preservative solution of dimethylaminoborane.

3,667,992

FULMINATING MATERIAL APPLICATION TECHNIQUE

Stephen V. Brown, Williamsport, Thomas B. McDonough, Allenwood, and John W. Shaffer, Williamsport, Pa., assignors to Sylvania Electric Products Inc.

Filed Oct. 22, 1970, Ser. No. 83,135
Int. Cl. B44d *1/14*
U.S. Cl. 117—69 8 Claims



A method of applying fulminating material on the primer anvil wire of a percussive-type photoflash lamp in which: the anvil wire is dipped into an aqueous slurry containing red phosphorus to provide a coating thereof on the wire; the coating is dried; and then the coated wire is dipped into an aqueous solution of sodium chlorate so as to permeate the phosphorus containing coating with the chlorate solution.

3,667,993

METHOD FOR COATING A SUBSTRATE WITH A HEAT CURABLE SILICONE RUBBER AND RESULTING PRODUCT

Joseph Eugene Stevenson, Adrian, Mich., assignor to Stauffer-Wacker Silicone Corporation

No Drawing. Filed Mar. 27, 1968, Ser. No. 716,341
Int. Cl. B32b *25/20;* B44d *1/14*
U.S. Cl. 117—72 3 Claims

Substrates are coated with heat curable silicone rubbers using alkenyl acyloxysilanes as primers.

3,667,994

TEXTURED RELEASE PAPER

Franklin J. Ward, South Portland, Maine, assignor to Scott Paper Company, Delaware County, Pa.

No Drawing. Filed July 24, 1970, Ser. No. 58,175
Int. Cl. B32b *29/00;* B44d *1/14*
U.S. Cl. 117—76 P 4 Claims

A textured release paper is made by first coating a base paper with a mineral pigment coating having a smooth surface, then applying an alcoholic solution of

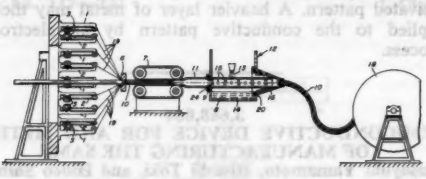
a polyamide which forms a textured surface upon drying and curing. Polyvinyl chloride plastisols are applied to the release paper, dried and cured, and when stripped off as self-supporting films exhibit the same embossed texture of the polyamide surface. The release coating may contain a thermosetting resin which provides hardness and solvent resistance to the release coating.

3,667,995

METHOD FOR COATING A REINFORCED HOSE

Robert H. Kaufman, Temple, and Donald Richardson, Wyomissing, Pa., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Nov. 5, 1970, Ser. No. 87,062
Int. Cl. B44d *1/08, 1/06*
U.S. Cl. 117—94 5 Claims



An improved method for manufacturing strand reinforced flexible hose comprising moving a strand covered hose carcass through a coating stage in such a manner that substantially only compressive forces are present in the hose carcass in the direction parallel to its longitudinal axis at the time the hose is wound on a reel for storage. The hose is ridded of any excess coating material and stored on a reel or other suitable storage device at a rate not greater than the rate at which the hose is exiting from the coating operation. The apparatus comprises means for moving the hose through the coating operation with substantially only compressive forces as aforesaid, and means for coating the strand reinforced hose.

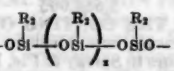
3,667,996

HYDROXYLATED COPOLYMERS COMPOSED OF MONOMETHYLSILOXANE UNITS AND DIPHENYLSILOXANE UNITS

Robert C. Antonen, % Dow Corning Corporation, Midland, Mich. 48640

No Drawing. Original application Feb. 25, 1969, Ser. No. 802,217, now Patent No. 3,632,798, dated Jan. 4, 1972. Divided and this application Oct. 27, 1970, Ser. No. 84,486
Int. Cl. B44d *5/00, 5/12*
U.S. Cl. 117—97 7 Claims

Hydroxylated copolymers of $(C_6H_5)_2SiO$ units and $CH_3SiO_{1.5}$ units are disclosed. The diphenylsiloxane units are present in an amount of 20 to 50 mol percent and are bonded to monomethylsiloxane units which contain the hydroxyl groups. Also disclosed are the above hydroxylated copolymers modified by linking segments of



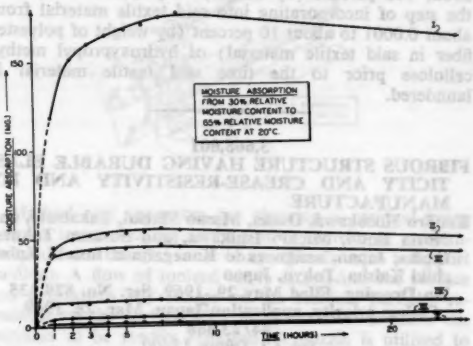
where x is at least 2 and R is methyl, phenyl or 3,3,3-trifluoropropyl and the segments are present in amounts of 1 to 50 weight percent. The hydroxylated copolymers and the modified hydroxylated copolymers are resins useful in protective coatings, laminates, release coatings and molding resins.

3,667,997

PROCESS FOR THE MANUFACTURE OF OPEN-PORE POLYVINYL CHLORIDE FOAMS HAVING HYDROPHILIC QUALITIES WHICH ARE CAPABLE OF A REVERSIBLE ABSORPTION AND YIELDING OF MOISTURE

Otto Fuchs, Oberlar, Germany, assignor to Dynamit Nobel AG., Troisdorf, Bezirk, Cologne, Germany

Filed Jan. 2, 1969, Ser. No. 789,083
Claims priority, application Germany, Jan. 2, 1968, P 16 69 997.1
Int. Cl. B32b *27/08*
U.S. Cl. 117—98 5 Claims


MOISTURE ABSORPTION FROM 30% RELATIVE MOISTURE CONTENT TO 65% RELATIVE MOISTURE CONTENT AT 20°C.
MOISTURE ABSORPTION (MG.)
TIME (HOURS)

Production of polyvinyl chloride foam form articles which are hydrophilic and have reversible absorption and desorption of moisture characteristics by impregnating previously formed foams of polyvinyl chloride with about 4 to 20 weight percent polyvinyl alcohol. The polyvinyl alcohols as used in an acetyl content of less than about 5% and are impregnated as an aqueous solution thereof.

3,667,998

PROCESS FOR APPLYING COHERENT COATINGS

Heinz Esser, Burscheid, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 26, 1969, Ser. No. 861,502
Claims priority, application Germany, Sept. 28, 1968, P 17 96 270.8
Int. Cl. B44d *1/08, 1/12*
U.S. Cl. 117—105.5 6 Claims

Process for the production of a coherent coating on a support by the method of simultaneously spraying a dispersion of rubber or synthetic resin and/or an emulsion of bitumen or tar or tar pitch, with a precipitating agent for the emulsion or dispersion, on to the support in which process a dispersion or emulsion is used which contains 5 to 85% by weight of an inorganic, non-fibrous filler, based on its total solids content.

3,667,999

FLAME RETARDANT CELLULOSIC MATERIALS

Francis Raymond Stoveken, Scotch Plains, and Warren Clifford Mayer, Somerville, N.J., assignors to Johnson & Johnson

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,414
Int. Cl. C09k *3/28;* C09d *5/18;* D21h *1/28*
U.S. Cl. 117—137 6 Claims

Flame retardant materials having excellent tensile strength, good tear resistance and elongation, improved drape and softness comprising a cellulosic base structure, a self cross-linked polymeric acrylic resin, ammonium bromide, and a weakly basic, water-soluble aliphatic organic, nitrogenous compound containing an amino group; and methods of making the same by simplified single-bath procedures.

3,668,000

ANTI-SOILING POLYESTER TEXTILE MATERIAL

Alex S. Forschirm, Lake Hiawatha, and Louis E. Trepasso, Westfield, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 845,039, July 25, 1969. This application Apr. 2, 1970, Ser. No. 22,140

Int. Cl. B23b *27/06;* D06m *15/04*

U.S. Cl. 117—138.8 F 3 Claims

There is provided a method of preventing wet-soil redeposition and improving the stain-release characteristics of textile materials comprised of from about 20 to about 100 percent (by weight) of polyester comprising the step of incorporating into said textile material from about 0.0001 to about 10 percent (by weight of polyester fiber in said textile material) of hydroxypropyl methyl cellulose prior to the time said textile material is laundered.

3,668,001

FIBROUS STRUCTURE HAVING DURABLE ELASTICITY AND CREASE-RESISTIVITY AND ITS MANUFACTURE

Kenjiro Hosokawa, Osaka, Masao Matsui, Takatsuki, and Noria Endo, Michio Ishikawa, and Susumu Tokura, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed May 29, 1969, Ser. No. 829,135

Claims priority, application Japan, Mar. 28, 1969, 44/23,608

Int. Cl. D06m *15/00*

U.S. Cl. 117—139.4 29 Claims

A fibrous structure such as yarns, fabrics, clothes and the like, having durable elasticity and crease-resistivity, particularly ladies hosiery having excellent smoothness, softness and stretchability, which is manufactured by applying homogeneously to a fibrous structure at most 10% by weight, based on the structure, of polyorganosiloxane prepolymer in the form of its non-aqueous solution together with catalyst for polymerization thereof and then by heating the structure at 50–200° C. to polymerize prepolymer thereon into polyorganosiloxane having an elongation at break of at least 50%, a tensile strength at break of 1–50 kg./cm.^{2} and a hardness of 5–50°.

3,668,002

SHADOW MASK HAVING FOCUSING FUNCTION AND METHOD OF MAKING SAME

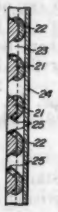
Tadao Okabe, Hachioji-shi, Makoto Tanaka, Musashinoshi, Shozo Tamura and Masakazu Fukushima, Hachiojishi, and Mitsuru Oikawa, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 25, 1969, Ser. No. 836,519

Claims priority, application Japan, July 1, 1968, 43/45,085; Dec. 6, 1968, 43/88,980

Int. Cl. H01j *29/46*

U.S. Cl. 117—210 6 Claims



A method of making a shadow mask having a focusing function comprising the steps of preparing an insulator having the form of a paste prepared by mixing powdered glass in a dispersion medium, thinly coating the insulator on a shadow mask electrode having electron beam holes, subjecting the insulator to heat treatment, and disposing a shadow mask lens electrode on the insulator.

3,668,003

PRINTED CIRCUITS

Ralph William Furness, Ealing, London, England, assignor to Cirkitrite Limited

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,362

Int. Cl. C23c *3/02*

U.S. Cl. 117—212 10 Claims

A method is provided for forming a conductive pattern on a printed circuit board. A non-conductive substrate is first sensitized over an entire region and an activating agent is applied as a pattern within the sensitized region. The activated substrate is then immersed in an electroless plating solution to deposit a metal layer on the activated pattern. A heavier layer of metal may then be applied to the conductive pattern by an electrolytic process.

3,668,004

SEMICONDUCTIVE DEVICE FOR AND METHOD OF MANUFACTURING THE SAME

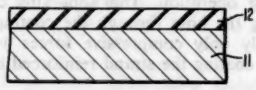
Masayuki Yamamoto, Hisashi Toki, and Hideo Shibuya, Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original application Aug. 30, 1967, Ser. No. 664,461. Divided and this application Aug. 29, 1969, Ser. No. 871,103

Claims priority, application Japan, Sept. 2, 1966, 41/57,558; Sept. 12, 1966, 41/59,837; Mar. 24, 1967, 42/17,991

Int. Cl. B44d *1/16, 1/18*

U.S. Cl. 17—215 8 Claims



This specification discloses a semiconductor device comprising a silicon substrate, an insulating film containing silicon oxide and phosphorus oxide which is formed on the surface of said silicon substrate, and a protective coating containing aluminum oxide which is formed on the insulating film.

In the semiconductor device of this invention, said protective coating containing aluminum oxide serves to prevent said insulating film containing silicon oxide and phosphorus oxide from reacting with any moisture in the external atmosphere, thereby improving the water resisting property of the semiconductor device and stabilising the semiconductor surface characteristics of the latter.

3,668,005

PROCESS FOR THE COATING OF ELECTRODES

Guy Sluse, Rixensart, and Gustave Joannes, Abolens, Belgium, assignors to Solvay & Cie, Brussels, Belgium

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,628

Claims priority, application Luxemburg, Jan. 9, 1970, 60,168

Int. Cl. B44d *1/18*

U.S. Cl. 117—215 13 Claims

Electrodes coated with ruthenium dioxide are manufactured by applying an anchoring layer containing at least one compound oxidizable by ruthenium tetroxide

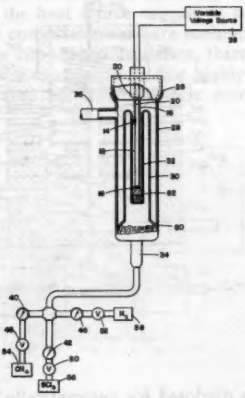
to the area of an etched metal support wherein the ruthenium dioxide is to be fixed, exposing the thus coated support to ruthenium tetroxide in the gaseous state, which is decomposed to ruthenium dioxide upon contact with the anchoring layer on which it is preferentially fixed and then heating the thus treated support. Electrodes produced in this manner have an adherent coating of ruthenium dioxide which is resistant to electrolyte corrosion and support high current densities.

3,668,006

FORMATION OF HIGH-STRENGTH HIGH-MODULUS COATED FILAMENTS

John B. Higgins, Philadelphia, and Arno Gatti, Norristown, Pa., assignors to General Electric Company

Continuation of application Ser. No. 483,978, Aug. 31, 1965. This application June 2, 1969, Ser. No. 834,194
Int. Cl. C23c *13/04*
U.S. Cl. 117—231 **1 Claim**



A substrate of core filament, of relatively small diameter, is heated to at least 900° C. in the presence of hydrogen, methane and boron trichloride in preselected proportions to produce a strong, stiff, relatively large diameter filament which, apart from the core, comprises a 21–35% carbon, remainder boron, compound essentially free of faults, cracks, grain boundaries, etc. Preferably a tungsten substrate filament about 1 mil in diameter is heated to 900° C. and then 1200° C. in the presence of an atmosphere comprised, in mole fractions, of the following: 0.605–0.686 hydrogen, 0.076–0.185 methane, and 0.210–0.238 boron trichloride. After several minutes filamentary diameters on the order of 4–7 mils are attained with filament properties approaching those of amorphous boron carbide.

3,668,007

SYRUP FRACTIONATION PROCESS

Carl Thomas Egger, Gerald Bernard Pfundstein, and Donald Lee Gillenwater, Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,302
Int. Cl. B01d *13/00*; C13k *1/06, 1/08*
U.S. Cl. 127—38 **5 Claims**

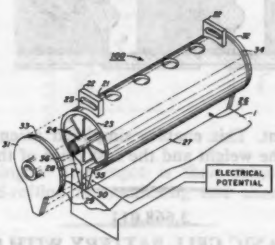
Starch is subjected to hydrolysis with an acid to convert the starch to hydrolyzate product which is then fractionated under applied pressure by means of membrane separation to recover a lower conversion product and a higher conversion product.

3,668,008

IONIZED AIR CLEANING DEVICE

Gerard T. Severynse, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,337
Int. Cl. G03g *13/00, 15/00*; B08b *5/00*
U.S. Cl. 134—1 **8 Claims**



Method and apparatus for cleaning a residual toner powder image bearing surface after transfer of substantially all of a charged toner image therefrom to a support medium. A flow of ionized air is directed to the surface and neutralizes any charge on the residual particles remaining on the surface after image transfer to allow the particles to be readily removed. A nozzle is utilized to direct the flow against the surface and ionizes the air flowing therethrough by applying a potential between two electrically insulated opposite sides of the nozzle.

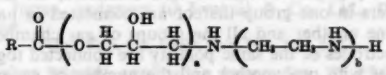
3,668,009

CLEANING METHOD

Fred Norman Teumac, South Bend, Ind., and Lester W. Harriman, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,079
Int. Cl. C23g *1/16*; B08b *3/08*
U.S. Cl. 134—2 **7 Claims**

Improved method of cleaning a ferrous metal surface having a hardness deposit by contacting it with an aqueous alkaline cleaning solution containing about 0.1 to 40 weight percent of an ammoniated polycarboxylic acid complexing agent. The improvement involves including with the solution in an amount of from 0.0005 to 0.1 weight percent a corrosion inhibiting compound of the formula:



wherein R is an alkyl or alkenyl group containing from 12 to 18 carbon atoms, *a* is 1 or 2 and *b* is 1–5.

3,668,010

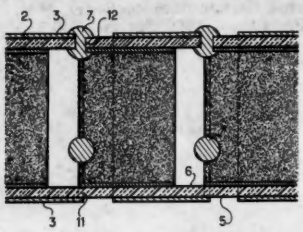
FUEL CELLS AND FUEL CELL BATTERIES OPERATING AT HIGH TEMPERATURE AND PROCESS OF MANUFACTURE THEREOF

Jacques Fally, Orsay, Yvon Lazennec, Saint-Michel-sur-Orge, and Claude Lasne, Antony, France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed May 15, 1970, Ser. No. 37,641
Claims priority, application France, May 16, 1969, 6915968; Oct. 1, 1969, 6935500
Int. Cl. H01m *27/16*
U.S. Cl. 136—86 F **19 Claims**

A solid electrolyte fuel cell operating at a high temperature, comprising several elements electrically connected in series. These elements are supported by one electrolyte

tube, and one end of the external electrode of an element protrudes slightly above the internal electrode of the following element. This enables simplified assembly and a reduction in the weight and the cost price of the fuel cell.



3,668,011

GALVANIC CELL BATTERY WITH GAS DIFFUSION ELECTRODES

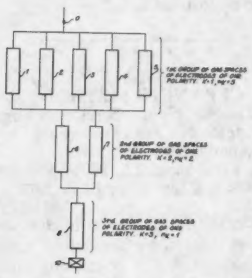
Horst Grune and August Winsel, Kelkheim, Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 8, 1968, Ser. No. 751,097

Claims priority, application Germany, Aug. 19, 1967, V 34,280

Int. Cl. H01m *27/02*

U.S. Cl. 136—86 R **11 Claims**



Galvanic cell battery having a plurality of gas diffusion electrodes of one or both polarities wherein the gas chambers of all the electrodes of one polarity are arranged in a plurality of groups such that, with respect to the flow of operating gas through the gas chambers, all the gas chambers in one group thereof are connected in parallel with one another and all the groups of gas chambers of the electrodes of the same polarity are connected together in series with one another and the number of gas chambers in the respective groups decreases continuously from the first to the last of the series of groups.

3,668,012

ELECTRODE FOR ELECTROCHEMICAL DEVICES AND METHOD OF ITS MANUFACTURE

Margarete Jung, Kelkheim, Taunus, and Hans H. von Doehren, Frankfurt am Main, Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 325,567, Nov. 22, 1963. This application Nov. 13, 1968, Ser. No. 791,827

Int. Cl. H01m *27/04*

U.S. Cl. 136—86 D **7 Claims**

An electrode especially suitable for use in electrochemical cells, like in a fuel cell with alkaline electrolyte in which the catalytically active metal is Raney metal, Raney iron or Raney cobalt partically coated with copper, mercury, silver, or alloy or a mixture thereof. The fuel cell comprising conventional elements, an alkaline electrolyte and said electrode. The electrodes have improved catalytic activity, especially improved load capacity and an improved rest potential.

3,668,013

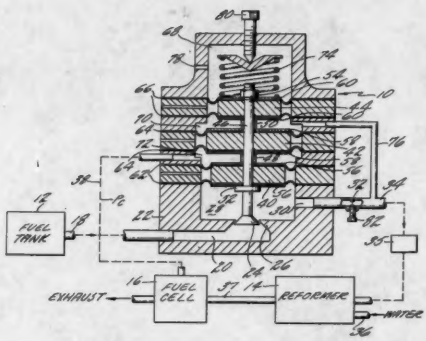
FUEL CELL SYSTEM WITH PNEUMATIC FUEL FLOW CONTROL

Thomas C. Franz, Bolton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 21, 1969, Ser. No. 817,697

Int. Cl. H01m *27/02*; G05d *11/02*

U.S. Cl. 136—86 B **5 Claims**



A control is disclosed for automatically metering fluid flow as a function of the difference between two pressures or of a single pressure. A restriction is disposed in the fluid outlet line so that the metered flow will depend upon pressure differential across the restriction. The pressure upstream of the restriction is regulated by a valve in the supply line activated by a computing diaphragm assembly consisting essentially of three spaced interconnected disc elements responsive to the difference between the two pressures or a single control pressure when one of the pressures is fixed.

3,668,014

ELECTRODE AND METHOD OF PRODUCING SAME

Emanuel G. Katsoulis, Long Island City, and William S. Pryor, Roslyn Estates, N.Y., assignor to Leesona Corporation, Warwick, R.I.

No Drawing. Filed June 10, 1968, Ser. No. 735,581

Int. Cl. H01m *35/00*

U.S. Cl. 136—120 **10 Claims**

A mat of polyfluorocarbon fibers having controlled pore size and hydrophobicity is impregnated with a catalytic substance to form a light-weight catalytic mass having a low, uniform loading of the catalytic substance. This catalytic mass, particularly when combined with an electrically-conducting element, and/or a continuous hydrophobic polymer membrane is suitable for use as an electrode in an electrochemical cell, e.g. as a fuel or oxidant

electrode in a fuel cell or as the cathode in a metal-air battery, wherein it provides high current densities at relatively constant voltages over a long period of time.

3,668,015

HIGH VERSATILE RADIOISOTOPE THERMOELECTRIC GENERATOR

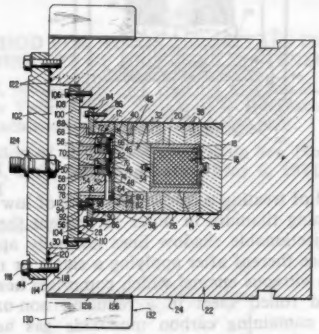
Alan J. Streb, George S. Stivers, and Howard R. Kelly, Baltimore, Md., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed May 15, 1967, Ser. No. 638,367

Int. Cl. H01v *1/04, 1/30;* **G21h** *1/10*

U.S. Cl. 136—202 **10 Claims**

An improved thermoelectric generator assembly including a radioisotopic heat source capsule, thermal insulation in the form of an open-ended cup surrounding the capsule and directing the heat axially toward the open end, shielding means including an open-ended corrosive resistant cylindrical casing for receiving the cup-shaped insulation and the heat source capsule in nested fashion. Thermoelectric converter means are positioned within the open end of the cup-shaped insulation, thermally coupled to the heat source capsule, and a first highly heat conductive cover overlies the thermoelectric converted means



with its periphery contacting a portion of the open-ended casing. A second corrosive resistant cover overlying the first cover, sealed to the cylindrical casing and forming therewith a highly corrosive resistant assembly.

3,668,016

PROCESS FOR PRODUCING COLD-ROLLED STEEL PLATE HIGH IN THE COLD-FORMABILITY

Mineo Shimizu, Hiroshi Takechi, Hiroyuki Kajioka, and Minoru Kawaharada, Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

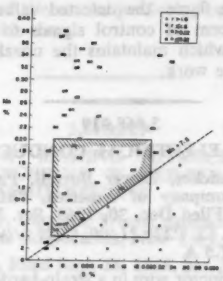
Filed Mar. 3, 1969, Ser. No. 803,669

Claims priority, application Japan, Mar. 2, 1968, 43/13,459

Int. Cl. B22d *25/06*

U.S. Cl. 148—2 **1 Claim**

Cold-rolled steel having excellent cold-formability is made by pouring into a mold a molten steel having a composition of C≦0.07 wt. percent, 0.04 to 0.20 wt. percent Mn, 0.004 to 0.020 wt. percent S, the ratio of Mn to S being at least 7, not more than 0.0030% N, and the balance iron and impurities. The molten steel is allowed to rim in the mold for a time interval. Then the core of the molten steel is killed by adding Al to the molten steel after the time interval, such that the acid-soluble Al in the remaining molten steel is more than 0.010% to



obtain an ingot. The ingot is then subjected to hot-rolling, cold-rolling recrystallizing and annealing.

3,668,017

TUNGSTEN BORIDE-CONTAINING ARTICLES AND PRODUCTION THEREOF

Daniel Paul Henri Mandineau, Ponthierry, Michele Yvonne Christiane Mourey, and Georges Philippe Henri Pizzini, Paris, and Jacques Constant Poulain, Antony, France, assignors to Ecole Nationale Superieure des Mines de Paris, and Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., both of Paris, France

No Drawing. Filed Dec. 5, 1969, Ser. No. 882,713

Claims priority, application France, Dec. 10, 1968, 177,408

Int. Cl. C23c *11/08*

U.S. Cl. 148—6.3 **2 Claims**

Articles, preferably of filamentary form, containing or consisting essentially of tungsten boride have improved mechanical properties when the tungsten boride W_2B_5 constitutes at least 80% of the tungsten boride content. When the article consists of a tungsten boride core with an outer layer of boron, the latter is preferably amorphous.

3,668,018

METHOD OF AUTOMATICALLY CONTROLLING THE LOCATION OF A NOZZLE IN HEAT TREATMENTS BY HOT GAS FLAMES

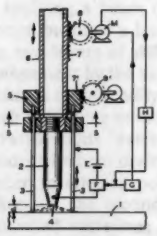
Yoshiaki Arata, Amagasaki, and Katsunori Inoue, Ashiyashi, Japan, assignors to Iwatani & Co. Ltd., Osaka, Japan

Filed Feb. 24, 1969, Ser. No. 801,286

Claims priority, application Japan, Apr. 30, 1968, 43/28,902

Int. Cl. B23k *7/00*

U.S. Cl. 148—9.5 **4 Claims**



The distance between a gas flame nozzle used in heat treating and the work is automatically controlled so that

the heat is transferred most effectively to the work. Electrodes adjacent to the nozzle project down toward the flame and detect any variation in electrical characteristics of the flame, the detected values being transmitted in the form of control signals to an automatic control system which maintains the nozzle at optimum distance from the work.

3,668,019

ALUMINUM ELECTRICAL CONDUCTOR WIRE

Harold Y. Hunsicker, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,313

Int. Cl. C22c *21/00*; C22f *1/04*

U.S. Cl. 148—11.5 A **8 Claims**

Electrical conductor wire in a strain-hardened condition suited for use in stranded conductors for above-ground power transmission and composed of an aluminum base alloy containing 0.04 to 0.3% magnesium and up to 0.5% copper, the balance being aluminum with certain maximum limits on other elements and impurities. This wire and stranded conductor produced therefrom exhibits a highly useful combination of conductivity, strength and resistance to creep.

3,668,020

METHOD OF MAKING STEEL WIRES

Wilbert A. Lucht, Orange, Conn., assignor to United States Steel Corporation

No Drawing. Original application Mar. 18, 1968, Ser. No. 714,074. Divided and this application Nov. 9, 1970, Ser. No. 88,132

Int. Cl. C21d *9/52*

U.S. Cl. 148—12 **6 Claims**

The method of making a high strength ductile cold drawn wire from hot rolled rods made from commonly used steels including .65 to 1.00% carbon, .25 to 1.20% manganese, .35% maximum silicon, .20% maximum aluminum, .05% maximum sulphur, .012% maximum nitrogen, and .05% maximum phosphorus, but with the addition of .03 to .15% vanadium and .20% maximum molybdenum. The hot rolled rod is drawn to finished size using only one patenting step with the reduction in area being at least approximately 60%.

3,668,021

HEAT-STABLE RUST INHIBITORS

Carlyle E. Shoemaker, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed Oct. 29, 1969, Ser. No. 872,091

Int. Cl. C21d *1/00*; C23c *3/04*; B44d *1/20*

U.S. Cl. 148—12.1 **5 Claims**

In a process for inhibiting formation of rust on cold rolled ferrous strip, the strip, either during the rolling operation or subsequent to it, but prior to annealing, is treated, as by spraying, with an aqueous suspension of calcium hydroxide. The heat-resistant solid component of the suspension dries on the strip as a semi-adherent coating, and protects the strip from rusting during storage and shipping.

3,668,022

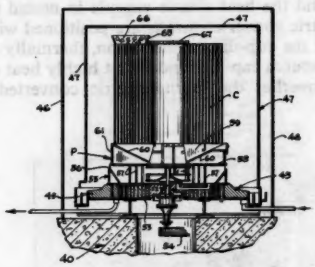
METHOD OF TREATING AN ALLOY STEEL FOR ENAMELING

John P. Novak, Homewood, Ill., assignor to Inland Steel Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 686,618, Nov. 29, 1967. This application Oct. 26, 1970, Ser. No. 83,946

Int. Cl. C21d *1/74*

U.S. Cl. 148—16 **7 Claims**



A method of treating a cold rolled sheet of low carbon steel containing titanium in order to prevent the occurrence of objectionable shadow lines normally appearing on the surface thereof after applying a single or multiple coating of a vitreous enamel which comprises heat treating the cold rolled sheet in a reducing non-oxidizing atmosphere containing carbon monoxide gas having a concentration between about 0.50% and 1.50% by volume and with a controlled amount of moisture so that the treating atmosphere remains non-oxidizing to the steel at heat treating temperature. The sheet is treated in either a continuous normalizing apparatus or in an open-coil annealing apparatus. The required amount of carbon monoxide gas can be provided in the treating atmosphere and the treating atmosphere maintained non-oxidizing to the steel by passing at least a portion of a reducing non-oxidizing treating atmosphere comprised of a mixture of hydrogen and nitrogen with a small amount of moisture through a porous bed of charcoal disposed within the treating zone.

3,668,023

TANTALUM-CONTAINING PRECIPITATION-STRENGTHENED NICKEL-BASE ALLOY

Peshotan Sohrab Kotval, 4923 Media Drive, Indianapolis, Ind. 46208

No Drawing. Filed June 20, 1969, Ser. No. 835,211

Int. Cl. C22c *19/00*

U.S. Cl. 148—32.5 **5 Claims**

Tantalum-bearing precipitation-strengthened hot-workable nickel-base alloys also containing chromium and molybdenum and having an intermetallic phase of stoichiometry A_3M wherein M consists essentially of Ta and wherein A consists essentially of nickel.

3,668,024

METHOD OF ANNEALING METAL POWDER

Milton Johnson, Waukesha, Wis., assignor to A. O. Smith-Inland Inc., Milwaukee, Wis.

Continuation-in-part of application Ser. No. 671,290, Sept. 28, 1967. This application Oct. 7, 1969, Ser. No. 868,269

Int. Cl. B22f 1/00

U.S. Cl. 148—126 12 Claims

The invention relates to a process for annealing steel powder. The powder is continuously passed through an annealing furnace and heated to a temperature in the range of 1450° F. to 2100° F. while exposed to a reducing gas. The dew point of the furnace atmosphere is maintained at a value slightly below the equilibrium value throughout the length of the heating zone by adjustment of the rate of flow of the reducing gas to the furnace.

By maintaining the dew point of the furnace atmosphere within precise limits, a substantially complete reduction of the carbon content of the steel particles is obtained and welding of the particles is prevented, so that the sintered cake of particles can be readily broken up after annealing to restore the as-atomized particle size and thereby provide an increased density for the compacted and sintered part.

3,668,025

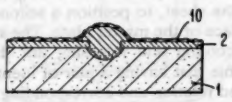
METHOD FOR ALLOYING METALS IN THE PRESENCE OF REACTIVE MATERIALS

Joseph M. Blum, Yorktown Heights, and Jan P. Hoekstra, Putnam Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 745,009, July 15, 1968. This application May 6, 1971, Ser. No. 140,941

Int. Cl. H01l 7/46

U.S. Cl. 148—178 31 Claims



The invention involves a process for alloying a metal such as aluminum into a semiconductor such as germanium in the presence of reactive insulating material such as silicon dioxide. A layer of an organic material is deposited on the surface of the insulating material prior to alloying and heated for a time and temperature sufficient to leave a residue of the organic material at the surface of the insulating material. The organic material is removed by spraying with an organic solvent such as trichloro-ethylene while the materials are still hot. Alloying of the metal with the semiconductor is then carried out and any reaction between the aluminum and the silicon dioxide which might be expected to occur is minimized.

3,668,026

CASTABLE PYROTECHNIC COLORED SMOKE COMPOSITION

Joseph E. Flanagan, Woodland Hills, Calif., assignor to North American Rockwell Corporation

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,177

Int. Cl. C06d 3/00

U.S. Cl. 149—19 12 Claims

A castable pyrotechnic composition for colored smoke production comprising iodoform in an amount sufficient to generate a colored smoke, an inorganic oxidizer in an amount sufficient to oxidize the composition and a suitable polymeric fuel binder in an amount sufficient to bind the ingredients of the smoke producing composition into a cohesive castable mass.

3,668,027

METHOD OF MAKING NITROCELLULOSE-NITROGLYCERINE WATER-BEARING EXPLOSIVE COMPOSITIONS

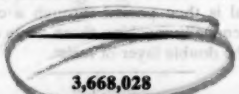
Gordon M. Gay, Tacoma, Wash., assignor to Comercial Solvents Corporation, New York, N.Y.

No Drawing. Filed Sept. 26, 1969, Ser. No. 861,490

Int. Cl. C06b 5/04

U.S. Cl. 149—95 2 Claims

Water-bearing explosive compositions characterized by high detonation velocity comprising a mixture of an inorganic oxidizer salt, nitroglycerine and/or other nitrate esters, nitrocellulose, water and a water thickening agent. The water-bearing explosive compositions, gels and slurries, are prepared by first pregelling nitroglycerine and nitrocellulose followed by adding the remaining ingredients of the explosive composition.



3,668,028

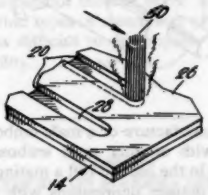
METHOD OF MAKING PRINTING MASKS WITH HIGH ENERGY BEAMS

Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 10, 1970, Ser. No. 45,157

Int. Cl. B41c 1/14

U.S. Cl. 156—3 9 Claims



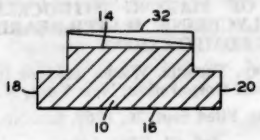
A stencil mask suitable for printing electronic circuits and the like is made by applying a beam of high-energy emissions such as an electron beam or a laser beam to an original blank comprising two layers of different volatilizability in response to impingement by the beam. The beam is applied to the layer which is more readily volatilized to form a groove therethrough bottoming at the inner surface of the second layer. Perforations extending entirely through the blank are produced where desired by increasing the beam energy applied to selected points along the bottom of the groove. Because the second layer is less readily volatilized, uncontrolled variations in the depths of the grooves and the danger of having a groove break entirely through the blank where this is not desired are minimized.

3,668,029

CHEMICAL MACHINING PROCESS

Raymond B. Blossick, Lancaster, and Robert A. Meier, Stevens, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 9, 1969, Ser. No. 865,100
Int. Cl. C23f 1/02
U.S. Cl. 156—11 1 Claim



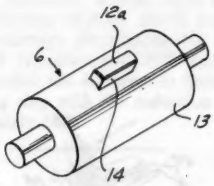
A process for chemically machining metals, particularly steels and steel alloys, to depths greater than 0.010 inches by using a chemical etching solution. The metal is coated with an etch-resist, exposed to an energy source to harden and bond a predetermined area of the resist to the metal and then developed to remove the unhardened and unbonded resist. The metal is then recoated with resist, again exposed to an energy source to harden and bond the second resist layer to the first resist layer at the aforesaid predetermined area and then developed to remove the unhardened and unbonded resist. The metal is then passed through a chemical etching solution to chemically machine those areas of the metal unprotected by the double layer of resist.

3,668,030

METHOD OF MAKING MATING MALE EMBOSSING ROLLS

Frank W. Broderick, 52 Pittsford Way, New Providence, N.J.

Filed Sept. 8, 1970, Ser. No. 70,434
Int. Cl. B44n 3/02
U.S. Cl. 156—14 20 Claims



A method for manufacture of a male embossing roll which registers exactly with another male embossing roll, which comprises forming in the second roll a mating female pattern, filling the female pattern depressions with resist, and then etching, thereby to produce a male design corresponding to the female design. The filling of the preliminarily formed female design by a resist comprising chrome plating is a preferred embodiment, the entire roll being chrome plated after the formation of the female design, the chrome plate then being removed from the surface of the roll except in those areas corresponding to the depressions in the female pattern previously formed therein.

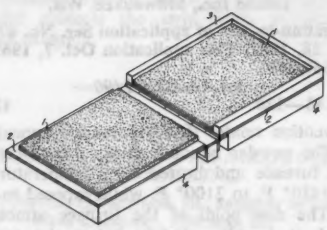
3,668,031

METHOD OF MAKING FOAM CORE SANDWICH PANEL

Bernard J. Bast, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed Mar. 3, 1970, Ser. No. 16,179
Int. Cl. B32b 5/18
U.S. Cl. 156—79 3 Claims

A method of making a foam core sandwich panel suitable for use in the building industry by spreading two horizontal panels with a polyurethane foamable resin, allowing the resin to expand partially, then bringing the panel sections with their foam faces together sandwich style, to a vertical position and allowing the foam to complete expansion, coalesce and gel in this vertical position.



3,668,032

METHOD OF MAKING A FLEXIBLE LETTERPRESS MAT

Charles W. Bunting; David P. Groeber, and Louis W. Pettlo, all of Dayton, Ohio, assignors to McCall Corporation, New York, N.Y.

Original application Aug. 28, 1967, Ser. No. 663,858, now Patent No. 3,568,595, dated Mar. 9, 1971. Divided and this application Oct. 26, 1970, Ser. No. 83,737
Int. Cl. B29c 17/04
U.S. Cl. 156—215 4 Claims

A first portion of a sheet of thermoplastic material is placed on the face of an engraved master plate, and the plate and sheet are positioned between the platens of a hydraulic press. The first portion of the sheet and the master plate are pre-heated and are then pressed together to mold an impression of the face within the first portion of the sheet. The master plate and sheet portion are cooled while the pressure is maintained, after which the pressure is released and the sheet is shifted laterally a precise predetermined distance relative to the master plate while maintaining the angular orientation of the sheet, to position a second portion of the sheet over the face of the master plate. The steps of pre-heating, pressing, cooling and releasing are then repeated to produce a flexible mat having a pair of identical impressions in precise spaced relation and corresponding angular orientation. One or more metal layers are electrolytically deposited on the mat, and the resulting thin sheet of deposited metal is separated from the mat and laminated to a pre-curved reinforcing plate which is trimmed along its edge.

3,668,033

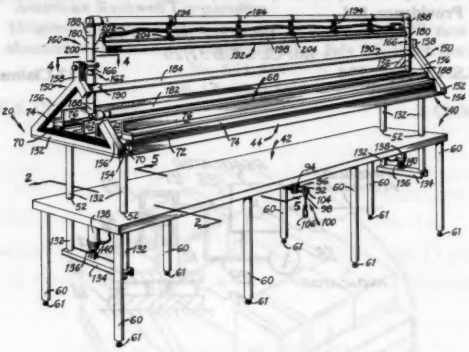
LAMINATING METHOD AND APPARATUS

Ralph M. Evans, Glendale, Ariz., assignor to Royal Industries, Pasadena, Calif.

Continuation-in-part of application Ser. No. 510,597, Nov. 30, 1965, now abandoned. This application Oct. 14, 1966, Ser. No. 586,803
Int. Cl. B29c 17/04
U.S. Cl. 156—212 12 Claims

A method and apparatus for making a configurated, laminated workpiece, the apparatus being comprised of a forming press having a lower, stationary platen and an upper reciprocable platen which cooperate to apply pressure to selected portions of the laminated workpiece. Movable edge members are hingedly attached to the upper platen and are adapted to be manually rotated to bend veneer into a generally contiguous configuration with a base component. Alternatively, a latch mechanism may be used to forcibly rotate each edge member and bend the veneer. A heater is pivotally supported above the upper platen and upon a carrier frame or turnstyle which is freely, arcuately swingable through all or nearly all of 360° so that it may be easily positioned in the most effective location to accommodate soften-

ing of the veneer immediately prior to bending. A stationary heating element may be supported near the upper edge of the



lower platen to aid the pivotal heater in the softening process.

3,668,034

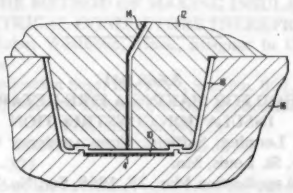
METHOD FOR MAKING A DECORATIVE PLASTIC LAMINATE

Arthur S. Nicholas, and Sarkis M. Kassouni, both of Grand Rapids, Mich., assignors to U. S. Industries, Inc.

Original application Mar. 26, 1968, Ser. No. 716,140. Divided and this application Aug. 5, 1970, Ser. No. 61,215

Int. Cl. B29c *19/00*

U.S. Cl. 156—245 **11 Claims**



This disclosure relates to plastic laminates, preferably in the nature of an article, having an outer metalized layer, an intermediate bonding layer of a relatively low melting point, and a backing layer formed of a synthetic thermoplastic material whose melting point is at least as high and preferably higher than the melting point of the intermediate layer. The laminate is formed by bonding the outer metalized layer to the intermediate layer, preferably by heat fusion, placing the laminate of the metalized layer and the intermediate layer into a mold and injecting the backing material into the mold to form an article and to bond the backing material to the intermediate layer.

3,668,035

PROCESS FOR ADHESIVE BONDING OF POLYVINYL CHLORIDE MATERIALS

Alois Felden, Munich, Germany, assignor to Stahlgruger Otto Gruber & Co., Munchen, Germany

Filed Apr. 24, 1969, Ser. No. 819,101

Claims priority, application Germany, Apr. 25, 1968, P 17 69 245.4

Int. Cl. B32b *31/00*

U.S. Cl. 156—249 **27 Claims**

A process for the adhesive bonding of PVC materials includes preparing at least of the bonding surfaces by purifying and/or roughening and coating with the adhesive, while the other surface which was provided with a completely dry adhesive coating is applied to and pressed against the moist adhesive surface.

3,668,036

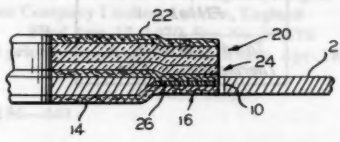
METHOD FOR ATTACHING GASKET AND/OR INSULATOR MEMBERS TO PLATE STRUCTURES

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co.

Filed Jan. 26, 1970, Ser. No. 5,734

Int. Cl. B32b *31/20*

U.S. Cl. 156—252 **11 Claims**



A method of securing top and bottom members to intermediate plate structures by providing spaced apertures in the plate, positioning members on either side of the plate at least one of which is provided with mating portions such that the mating portions are within the spaced apertures in engaging relationship with the other member and providing an adhesive on at least those portions of the members in mating engagement to thereby form a unitary structure of somewhat rigid stability. The products formed by the disclosed methods will find application for use in conjunction with carburetor assemblies wherein the plate structure is metal so as to act, for example, as a heat dissipator between the carburetor manifold and carburetor throttle body. The method may be used in many other types of assemblies wherein the assembly of three parts is difficult to accomplish at high speed with complete reliability.

3,668,037

METHOD FOR MAKING TABLETS

Boyd C. Blair, Topeka, Kans., assignor to Brackett Stripping Machine Co., Inc., Topeka, Kans.

Original application Jan. 15, 1968, Ser. No. 697,685, now Patent No. 3,560,311. Divided and this application Aug. 14, 1970, Ser. No. 63,815

Int. Cl. B32b *31/00*

U.S. Cl. 156—267 **4 Claims**

A method for making tablets and including arranging a plurality of sheets into a set, registering edges of the sheets in the set, moving sets in a defined path, adjusting the spacing between sets, holding the set in a pressed together condition, grinding one edge of the set and applying a hardenable quick drying adhesive to said one edge of the set, said method including maintaining the edges of the set in registry during grinding the one edge and applying adhesive thereto, said method including applying a strip having adhesive to the one edge, folding opposite margins of the strip to engage exterior sheets, and cutting the strip adjacent opposite ends of the one edge.

3,668,038

PROCESS FOR PREPARING A FLEXIBLE PACKAGING MATERIAL

Charles C. Kirk, Laurel; Thomas E. Ferington, Sandy Spring, and Razmic S. Gregorian, Silver Spring, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Original application Feb. 2, 1970, Ser. No. 692,240, now Patent No. 3,539,437. Divided and this application Feb. 2, 1970, Ser. No. 12,493

Int. Cl. B32b *33/00*

U.S. Cl. 156—276 5 Claims

This invention is directed to a process for preparing self-supporting laminate films having low permeability to gases and to the films prepared by said process, all as described hereinafter.

3,668,039

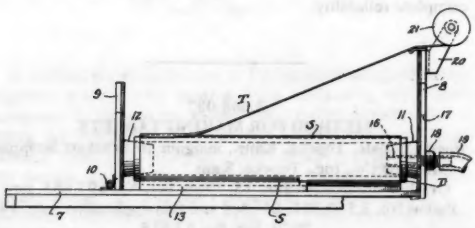
METHOD FOR JACKETING FIBROUS DUCTS

David Waksman, Roeland Park, Kans., and James R. Stewart, Kansas City, Mo., assignors to Certain-Teed Saint Gobain Insulation Corporation, Bala Cynwyd, Pa.

Filed Apr. 14, 1970, Ser. No. 28,369

Int. Cl. B29c *17/07*

U.S. Cl. 156—287 6 Claims



A method and apparatus for applying a jacket sheet to an open ended porous fibrous duct, by wrapping the sheet around the duct, applying end closures to the ends of the duct, at least one such closure having a vacuum connection so that by reduction of pressure in the interior of the duct, the external atmospheric pressure will serve to hold the jacket sheet snugly against the duct, and interconnecting the adjacent edges of the jacket sheet while it is being held snugly against the exterior of the duct under the influence of the reduced internal pressure and the external atmospheric pressure.

3,668,040

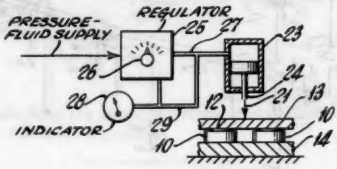
METHOD AND MEANS FOR BONDING BEARING LINERS

Gordon J. Clark, Bristol, Conn., assignor to Textron Inc., Providence, R.I.

Filed Nov. 3, 1969, Ser. No. 873,161

Int. Cl. B32b *31/20*

U.S. Cl. 156—294 12 Claims



The invention contemplates maintenance of uniform controlled pressure and temperature at the zone of bonding a fabric or the like liner to a bearing ring or the like, the pressure and temperature being at the levels required for optimum curing of the particular thermosetting material involved. The pressure is developed by axial compression of an elastomeric plug, which is so constrained that radial loading of the lining on the bearing element necessarily results from hydrostatic deformation of the plug. The heat supplied for curing also causes the plug to expand, but the invention provides for automatic compensation for plug expansion so as to maintain substantially constant pressure loading on the liner in the course of a curing cycle. Means are disclosed for the bonding of a plurality of lined bearing elements in a single batch processing cycle.

3,668,041

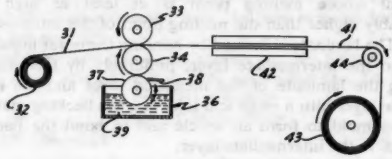
METHOD FOR MAKING A FIRE-RETARDANT INSULATION CONSTRUCTION

Thor J. G. Lonning, Suffield, Conn., assignor to Monsanto Company, St. Louis, Mo.

Original application Mar. 25, 1968, Ser. No. 715,892. Divided and this application Feb. 27, 1970, Ser. No. 18,393

Int. Cl. C09j *7/00*

U.S. Cl. 156—309 3 Claims



A method for making a fire-retardant, faced, low density insulation construction from a preformed facing layer comprising vinyl chloride polymer and flame retardant plasticizer composition therefor; a preformed bat comprising a matrix of siliceous fibers bound together with a thermoset aminoplast modified phenolic resin adhesive, and a preformed solid adhesive layer comprising vinyl chloride polymer resin adhesive having a heat softening temperature below the heat softening temperature of said facing layer, said method comprising the steps of heat fusing a said facing layer to a said adhesive layer and heat fusing the laminate comprising such facing layer and such adhesive layer to a said bat.

3,668,042

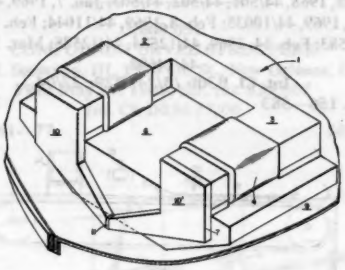
PROCESS FOR PRODUCING MAGNETIC TRANSDUCER WITH NARROW SENSING TIP

William A. Farrand, Fullerton, Calif., assignor to North American Rockwell Corporation

Original application Mar. 15, 1967, Ser. No. 623,385, now abandoned. Divided and this application July 14, 1969, Ser. No. 851,534

Int. Cl. C09j 5/00

U.S. Cl. 156—309 1 Claim



A process for producing magnetic transducer comprising a relatively thin portion forming a sensing tip connected to a relatively thicker core portion including conductors wound around the core portion. The thin portion is separated in the region of its tip by a narrow gap filled with a material for forming a magnetic flux insulator.

3,668,043

METHOD OF BONDING POLYPROPYLENE TO RUBBER AND THE METHOD OF MAKING INSULATED ELECTRICAL CONDUCTORS THEREFROM

Gordon J. Muise, Westboro, Mass., assignor to United Steel Corporation

Original application Sept. 20, 1969, Ser. No. 801,188, now Patent No. 3,592,728. Divided and this application Nov. 17, 1970, Ser. No. 90,473

Int. Cl. C09j 5/00; B32b 25/08

U.S. Cl. 156—321 2 Claims

The method of the invention comprises the steps of providing an electrically conductive metal core, covering the core with a polyolefin insulating layer, heating the insulating layer to a temperature of 400° to 500° F., then applying a suitable adhesive composition to the insulating layer while it is in the temperature range of 400° to 500° F., then applying a second application of the adhesive composition to the polyolefin-adhesive covered conductor, and then applying an elastomer sheath to the polyolefin-adhesive covered conductor after the second application of adhesive composition has been applied thereto.

3,668,044

APPARATUS FOR BONDING SEMI-CONDUCTIVE DEVICES

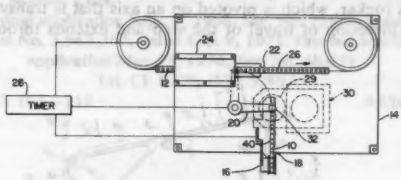
Mordechai Wiesler, Lexington, and John S. Macintyre, Lynnfield, both of Mass., assignors to Teledyne, Inc., Hawthorne, Calif.

Filed Apr. 9, 1970, Ser. No. 26,838

Int. Cl. B32b 31/20

U.S. Cl. 156—366 11 Claims

Semi-conductive devices are assembled and bonded to package bases on an automatic basis. The devices are transferred one at a time from a tape indexing unit onto an indexing carrier which convey package assemblies through a heating zone prior to receipt of the dice. The tape indexer includes a drive mechanism adapted to feed a tape carrying a plurality of longitudinally spaced dice past a pick-off point where a vacuum transfer arm moves an individual die from the tape to a pre-positioned and pre-heated package unit on



the carrier. The transfer arm includes a vibratory tip to produce a scrubbing motion between the die and the lead to enhance the bonding action between the parts.

3,668,045

APPARATUS FOR PRODUCING ROD-LIKE ARTICLES

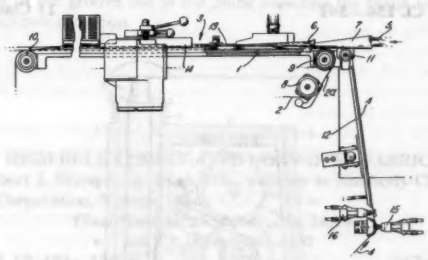
Desmond Walter Molins, London, England, assignor to Molins Machine Company Limited, London, England

Filed Apr. 17, 1970, Ser. No. 29,478

Claims priority, application Great Britain, Apr. 18, 1969, 20,001/69

Int. Cl. B65h 81/00

U.S. Cl. 156—441 1 Claim



In the production of a continuous wrapped rod, e.g. of filter material for subdivision into filter rods, the continuous wrapper web is provided along each of its marginal portions, but on opposite sides, with a line of heat-sensitive polyvinyl acetate which is dried before the marginal portions are foled on each other, and is then reactivated by heat.

3,668,046

APPARATUS FOR PERFORMING WELDING OR HOT GLUING OPERATIONS ON CONTINUOUSLY MOVED WEBS

Frank Bosse, Ibbenburen-Dorenthe, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Apr. 22, 1970, Ser. No. 30,867

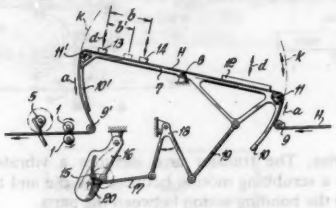
Claims priority, application Germany, May 14, 1969, P 19 24 730.4

Int. Cl. B32b 31/20, 31/08

U.S. Cl. 156—553 7 Claims

In flat bag-making machines, a web which is thermoplastic or coated with a thermoplastic layer is withdrawn from a supply roll and continuously advanced, formed into a tubing in a tube-making device, whereafter the tubing is processed to form flat bags in that welded or hot glued seams are formed and the tubing is transversely cut. The apparatus comprises a carrier, which supports the web and on which the heated welding or hot gluing jaws are mounted to be reciprocable to and from the carrier, whereas the carrier it-

self is reciprocable relative to the web in the direction of travel thereof in such a manner that the movement of the carrier relative to the web is zero for a time which is sufficient for the welding or gluing operation. The carrier consists of a rocker, which is pivoted on an axis that is transverse to the direction of travel of the web and extends through the



transverse center plane of the rocker, the latter is pivotally movable within a loop which is formed in the web by means of two stationary guide rollers, and the rocker is provided with drive means which impart to the rocker a rocking motion at a peripheral velocity which is temporarily equal to the velocity of travel of the web.

3,668,047

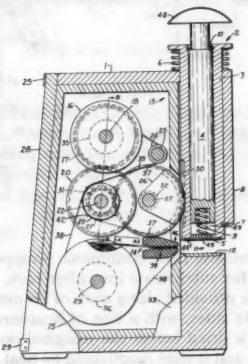
BONDING MACHINE

Kenneth G. Heller, 335 Palomar Drive, Redwood City, Calif.

Filed Nov. 20, 1969, Ser. No. 878,514

Int. Cl. B32b *31/06;* **B65c** *9/18*

U.S. Cl. 156—541 **11 Claims**



A bonding machine for adhesively joining sheets of paper or the like, having as its principal elements a housing, and within it an anvil, an actuating mechanism, and a tape system. When the machine is idle there exists a gap between the anvil and the surface of the actuating mechanism facing it. Sheets to be bonded are placed into this gap. When the actuating mechanism is depressed it moves down toward the anvil, thus compressing the sheets. Upon releasing the actuating mechanism it moves away from the anvil and picks up the topmost sheet by vacuum action. At the same time the tape system transports a two-sided adhesive sticker between the separated sheets. When the actuating mechanism is again depressed, the sheets are recompressed but this time over the sticker, thus making a bond. The bonded sheets may be withdrawn as soon as the actuating mechanism is released again. The cycle may be repeated several times if more than two sheets are to be bonded together. The tape system, preferably in cartridge form, consists of two-sided adhesive stickers stored on a supply spool between cover films. A takeup spool reels in spent cover films. Gears, drive sprockets, and clutches transmit and synchronize motions of actuating mechanism, tape, and spools, so that the stickers are fed into the gap at the correct moment, and to the correct depth, and so that the proper tension in tape and spent films is maintained at all times.

3,668,048

PLASTIC EGG PACKAGE SPOT WELDING APPARATUS

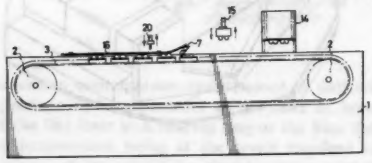
Hikoji Noguchi, and Yoshinobu Miyazato, both of Tokyo, Japan, assignors to said Noguchi, by said Miyazato

Filed Nov. 14, 1969, Ser. No. 876,906

Claims priority, application Japan, Feb. 14, 1969, 44/10912, 44/10913; Dec. 23, 1968, 43/112452, 43/112453, 43/112454; Dec. 28, 1968, 44/501, 44/502, 44/503; Jan. 7, 1969, 44/2071; Feb. 5, 1969, 44/10035; Feb. 8, 1969, 44/11044; Feb. 13, 1969, 44/12583; Feb. 14, 1969, 44/12584, 44/12585; Mar. 19, 1969 44/24608

Int. Cl. B30b *15/34;* **B29c** *27/04*

U.S. Cl. 156—583 **13 Claims**



Apparatus for continuously sealing the flange of the cover to the flange of the body of a plastic egg package with a plurality of spot welds using intermittently moving receiving boxes adapted to hold the body of the egg package with the flange of the body resting thereon with the cover thereof protruding outside thereof and means for closing the cover tightly against the body for spot welding the flanges.

3,668,049

LAMINATED PACKING MATERIAL WITH SPACED PARALLEL REINFORCING MEMBERS

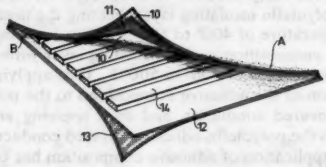
Ade William Silfverlin, Sandviken, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandvikens, Sweden

Continuation of application Ser. No. 783,478, Dec. 13, 1968, now abandoned. This application June 17, 1971, Ser. No. 154,198

Claims priority, application Sweden, Dec. 19, 1967, 17384/67

Int. Cl. B32b *3/10*

U.S. Cl. 161—38 **6 Claims**



A laminated packing material consisting essentially of two outer, layer-like members and an intermediate array of spaced, parallel, stiffening rib members secured to said outer members. At least one of said outer members may comprise two layers of paper with an intermediate layer of fabric. The rib members may be in the form of relatively short, flat, strips of wood fiber board whose abutting ends are staggered from rib to rib.

3,668,050

SURGICAL DRAPE

Harold F. Donnelly, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 9, 1970, Ser. No. 17,431

Int. Cl. A61f *13/00;* **B32b** *3/26, 27/40*

U.S. Cl. 161—39 **15 Claims**

Disposable surgical drape comprising a fibrous base sheet having a primary operative area; a sheet of fluid impervious plastic film, such as polypropylene film, laminated to the

base sheet in the primary operative area; and a sheet of fluid absorbent plastic foam material, such as a thin sheet of

polyurethane foam, laminated to the outer surface of the film.

3,668,051

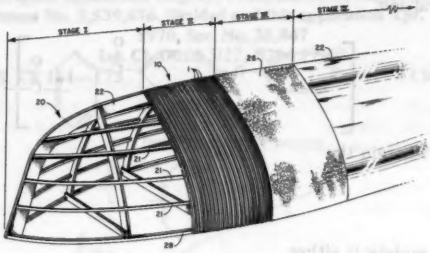
COMPOUND-CURVED STRUCTURE

William H. Seemann, III, 1320 6th St., New Orleans, La.

Filed May 29, 1969, Ser. No. 829,067

Int. Cl. D03d *17/00*

U.S. Cl. 161—77 **10 Claims**



A method of constructing boat hulls by fiberglass or ferrocement techniques utilizing a surface defining base material of a pliable sheeting material of, for example, a loosely woven fabric or elastic mesh reinforced with springy rods of, for example, fiberglass or steel; the base material is attached to a skeleton framework and readily and easily assumes and forms the compound-curved surface of the hull, and a resin or concrete is subsequently added and allowed to harden.

3,668,052

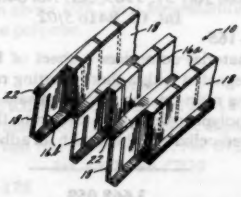
CORRUGATED ARCUATE MEMBER

Richard D. Pratt, Cincinnati, Ohio, assignor to General Electric Company

Filed Mar. 20, 1970, Ser. No. 21,405

Int. Cl. B32b *1/00, 3/28*

U.S. Cl. 161—117 **2 Claims**



A corrugated arcuate member having a plurality of generally circumferentially disposed substantially rigid corrugations is provided with improved formability as a result of a plurality of generally transverse slots disposed along a radially outer portion of the corrugations. Arc-holding means is secured with the member to hold the member in arcuate shape.

3,668,053

ARTICLE FOR PREVENTING EDGE DEFECT IN COMPRESSION STRETCHED ACRYLIC SHEET

Ronald L. Ayres, Saugus, Calif., assignor to Fortin Plastics, Inc., Saugus, Calif.

Original application Sept. 9, 1968, Ser. No. 758,395, now Patent No. 3,562,383, dated Feb. 9, 1971. Divided and this application May 25, 1970, Ser. No. 48,691

Int. Cl. B32b *3/02, 3/30*

U.S. Cl. 161—118 **4 Claims**

An article for preventing edge defects in compression-stretched acrylic sheets comprising providing the circumferential end surfaces of an acrylic blank to be stretched with a groove substantially continuous therewith, the depth of the groove being greater than 5 percent and, preferably, being greater than about 10 percent of the initial thickness of the acrylic blank. The groove may have various configurations, e.g., V- and U-shaped configurations. Preferably, the center line of the groove lies in the plane bisecting the blank in the thickness direction.

3,668,054

HIGH BULK CORRUGATED NONWOVEN FABRIC

Robert J. Stumpf, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 31, 1970, Ser. No. 24,197

Int. Cl. D04h *1/00, 3/00*

U.S. Cl. 161—128 **5 Claims**

A tough, high bulk, flexible fabric is provided which has a grainy wrinkled texture with a multiplicity of transversely discontinuous furrows and ridges. The fabric is somewhat elastic, especially in the machine direction, and comprises a corrugated web of initially alined textile fibers implanted in a continuous thin film of thermoplastic adhesive, the fiber-adhesive web thereafter being corrugated into a multitude of furrows and grooves with irregularly root- and side-connected convolutions. The fabric is produced by implanting the fibers into the thermoplastic adhesive film, adhering the resulting web onto an abherent heated surface, and advancing the surface against a gathering blade to corrugate the web and form irregularly root- and side-connected sinusoidal convolutions.

3,668,055

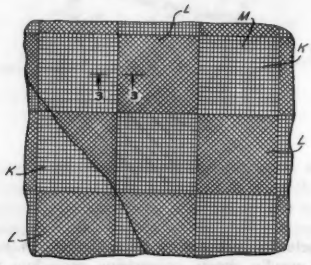
SUPERIMPOSED EMBOSSED PACKING SHEETS

George Gerard, Point Pleasant, N.J., assignor to Jiffy Manufacturing Co., Hillside, N.J.

Continuation of application Ser. No. 676,573, Oct. 19, 1967, now abandoned. This application Sept. 1, 1970, Ser. No. 68,745

Int. Cl. B32b *3/00, 7/00*

U.S. Cl. 161—136 **2 Claims**



The disclosure of the present application relates to embossment between engraved rollers of a series or plurality of sheets of relatively heavypaper or similar matted fibrous materials to obtain varying patterns of rows of mound-like embossments which are arranged in successive areas, usually successive squares, longitudinally and then diagonally in respect to the main axis of the paper sheets. After embossment the sheets are passed through shorter or longer paths of travel before again being assembled so that their matching mounds and recesses will be offset in such a manner that they will no longer match.

The disclosure further relates to the composite packing material and to a method and apparatus for making the same.

3,668,056

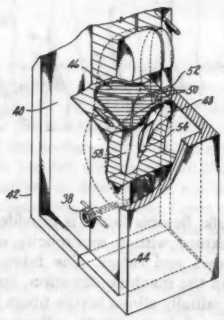
INTEGRAL MICROPOROUS ARTICLE AND PROCESS OF MAKING

Stanley I. Hayes, Jr., Hamilton, Mass., assignor to USM Corporation, Flemington, N.J.

Filed Dec. 12, 1969, Ser. No. 884,571

Int. Cl. B29d *27/04;* **B32b** *3/26*

U.S. Cl. 161—159 **18 Claims**



A one-piece microporous clothing article such as a shoe upper or glove is formed by molding a solidifiable liquid emulsion of fine droplets of an organic liquid in a continuous phase comprising reactive material convertible through reaction to solidified resilient condition. The emulsion is caused to gel and solidify with said droplets held in the solidified material, the solidified material in the form of a shoe upper or glove is removed from engagement with the molding surface and the liquid is removed without expanding the solidified material leaving pores and discontinuities in the solidified material to constitute passageways for air and vapor.

3,668,057

LAMINAR STRUCTURES OF METAL AND CRYSTALLINE COPOLYKETONES AND METHOD OF FORMING SAME

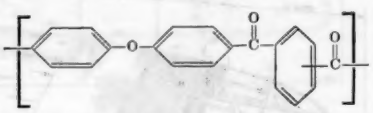
Franco Agolini, and Rudolph John Angelo, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 10, 1970, Ser. No. 45,235

Int. Cl. B32b *15/08*

U.S. Cl. 161—165 **16 Claims**

A laminar structure is provided which is characterized by at least one layer of a metal bonded to at least one layer of a crystalline copolyketone having the following recurring structural unit:



wherein the

moiety is either

(T moiety) or

(I moiety), and the T:I ratio varies from 90:10 to 50:50; said laminar structure being useful for printed circuit applications.

3,668,058

MATRIX MATERIAL FOR PRODUCTION OF PLASTIC PRINTING PLATES

Nicholas J. Pappadakis, Lincroft, N.J., assignor to Tenneco Chemicals, Inc.

Filed July 31, 1969, Ser. No. 846,341

Int. Cl. B41b *5/02*

U.S. Cl. 161—165 **9 Claims**

A matrix material comprises a sheet of fibrous cellulosic material impregnated with a thermosetting resin, a coating of a thermosetting resin on one surface of said sheet, and a precast sheet of polypropylene film affixed to the coated side of the impregnated cellulosic sheet with an adhesive.

3,668,059

HIGH MODULUS BORON NITRIDE FIBERS

James Economy, Eggertsville, and Ruey-Yuan Lin, Williamsville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 8, 1971, Ser. No. 105,129

Int. Cl. C01b *21/06;* **C01g** *57/00;* **B32b** *15/02*

U.S. Cl. 161—170 **6 Claims**

Boric oxide fibers having a maximum diameter of about 10 microns are heated in an ammonia atmosphere under such

conditions as to produce partially nitrided fibers consisting essentially of B, N, O and H wherein the N is present to the extent of from about 35 percent to about 55 percent. The partially nitrided fibers are then heated in an inert atmosphere at a temperature of at least about 1800°C while simultaneously subjecting the fibers to sufficient longitudinal tension as to at least prevent longitudinal shrinkage of the fibers and preferably to cause elongation of the fibers during heating. The resulting fibers, consisting essentially of boron nitride, are of high purity and are characterized by a relatively high Young's modulus of elasticity, which renders them especially suitable for reinforcing plastic, ceramic or metal matrices in the preparation of fiber reinforced composites.

3,668,060

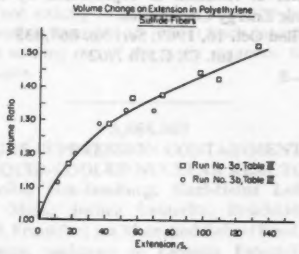
FILAMENTS AND FILMS OF POLYMERS OF ALKYLENE SULFIDES

Walter J. Polestak, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Original application Aug. 29, 1966, Ser. No. 575,722, now Patent No. 3,539,676. Divided and this application Apr. 10, 1970, Ser. No. 31,447

Int. Cl. D01d *5/22*; **B29d** *27/00*

U.S. Cl. 161—173 **8 Claims**



Hard stretch filaments and films produced by extruding a heat softened or molten polymer of alkylene sulfide, such as polyethylene sulfide, having an inherent viscosity of about 0.5 or greater, through a shaping orifice to form the filament or film and taking up the product at a linear rate of from 20 to 3,000 meters per minute at a drawdown ratio of from 100:1 to 4000:1. A filament which spontaneously develops helical crimps along its length produced when a drawdown ratio greater than 1200:1 is used. Open-celled filaments or films produced from the hard stretch filaments and films by stretching the filaments or films in a range of from about 50 percent of the unstretched length up to about 90 percent of the breaking elongation and stabilized by heating the filament or film while in the stretched state to a temperature in the range from about 80°C. to a temperature below the melting point of the polymer.

3,668,061

TEAR STRING FOR SHRINK FILM PACKAGES

Harold M. Forman, 151 East 10th St., Conshohocken, Pa.

Filed Nov. 5, 1970, Ser. No. 87,238

Int. Cl. B65d *17/20*

U.S. Cl. 161—175 **10 Claims**

A tear string having particular utility in connection with packages overwrapped with heat sealable shrink film comprises an elastic core, one or more textile covers wrapped around the core and an outer coating of a fused thermoplastic synthetic resin. The core is in tension and, additionally, the outer coating may be axially oriented. Thus, when the string is heated to the thermoplastic temperature of the resin coating, the stored tensile forces in the core are released and tend to make the string contract toward its original dimensions. This effect is enhanced if the coating is axially oriented, due to the heat shrinking phenomenon. Such a tear string has various advantages in shrink film wrapped packages.

3,668,062

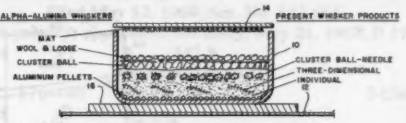
THREE-DIMENSIONAL CRYSTAL WHISKERS AND METHOD FOR PREPARATION THEREOF

James J. Shyne, Caldwell, and John V. Milewski, Saddle Brook, both of N.J., assignors to General Technologies Corporation, Reston, Va.

Continuation-in-part of application Ser. No. 479,111, Aug. 12, 1965, now abandoned. This application Sept. 8, 1969, Ser. No. 856,066

Int. Cl. C23c *13/00*; **C01f** *7/02*

U.S. Cl. 161—177 **7 Claims**



The invention disclosed is for three-dimensional crystal whiskers, a method for preparation thereof, and products containing such crystal whiskers. In one embodiment, the three-dimensional whiskers include a principal, rigid, elongated single crystal whisker fiber having a plurality of secondary, relatively shorter length, single crystal whiskers appended along the length of each of the principal whiskers and disposed in a direction generally transverse the axis of each of the principal whiskers. In a second embodiment, the crystal whiskers may be characterized as a cluster ball of needle-like whiskers.

3,668,063

REMOVAL OF ENTRAINED AIR FROM CELLULOSE PULP BEFORE BLEACHING OF THE PULP

Hans-Erik Engstrom, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Continuation of application Ser. No. 771,593, Oct. 29, 1968, now abandoned. This application Apr. 1, 1971, Ser. No. 130,504

Claims priority, application Sweden, Nov. 10, 1967, 15463/67

Int. Cl. D21c *3/26*

U.S. Cl. 162—19 **5 Claims**

Preliminary to being delivered by a "thick stock pump" means to a generally vertical bleaching vessel there is added to a cellulose pulp a fluid, such as steam, oxygen or a gaseous bleaching agent to flow countercurrent to the pulp in such manner that any air in the pulp is displaced and is replaced by bleaching agent before bleaching of the pulp in the bleaching vessel.

3,668,064

COMPOSITION BOARD AND METHOD OF MAKING IT

Leonard J. Kucera, Box 82 Rogers Route, International Falls, Minn.

Filed Jan. 28, 1970, Ser. No. 6,590

Int. Cl. D21h *3/00*, *3/06*

U.S. Cl. 162—171 **8 Claims**

This invention relates to a structural composition board and method of making it. The board is made from finely divided ligno-cellulose material and pulverized additives such as asphaltites and pulverized pine wood pitch. The pulverized material or materials are intimately mixed with the finely divided ligno-cellulose material in a liquid suspension. A board-like product is formed from the liquid suspension of ligno-cellulose and pulverized material; the board-like product is dried; dried board is subjected to pressure to consolidate and bond the board-like product while internal heat is above the softening point of the pulverized material in the

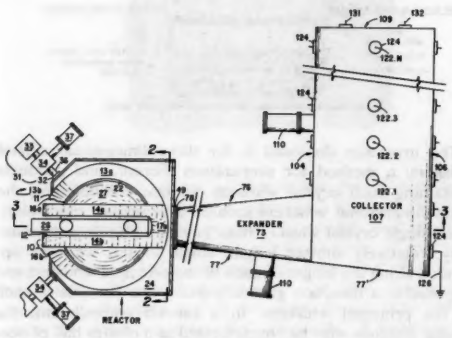
board-like product. At least about 5 percent of the asphaltites is employed in the board-like product.

3,668,065

APPARATUS FOR THE CONVERSION OF HIGH TEMPERATURE PLASMA ENERGY INTO ELECTRICAL ENERGY

Ralph W. Moir, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 15, 1970, Ser. No. 72,294
Int. Cl. G21b *1/00*
U.S. Cl. 176—3 **10 Claims**



High temperature plasma is produced in a controlled thermonuclear reactor and a plasma beam is directed therefrom through an expander having a decreasing intensity magnetic field to provide an ion beam in which the ions have substantially only translational kinetic energy. The ions of the beam are then directed, by application of an E × B field, into an offset collector system having collectors arranged in a zig-zag pattern while the electrons are separated from the ions. The collectors situated in an E × B field have progressively lower retarding potentials applied thereto so that ions having a kinetic energy exceeding that of a particular stage are collected in successively lower energy groups to produce an electrical current therein. An advantage is obtained in that ions in a beam having a wide energy spread are collected at an electrode where there is a low energy differential between the effective retarding potential of the particular collector electrode and the group of energetic ions collected thereat making for efficient conversion of the kinetic energy of the particles into electrical energy.

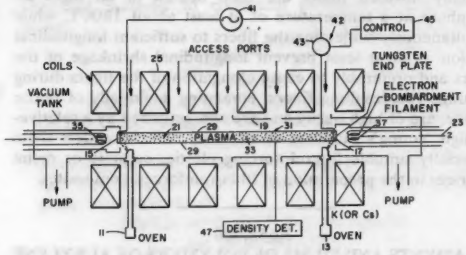
3,668,066

DYNAMIC STABILIZER FOR PLASMA INSTABILITIES TO IMPROVE PLASMA CONFINEMENT AND TO INCREASE PLASMA DENSITY

Hans W. Hendel, W. Princeton; Chu, Tsu-Kai, and Thomas C. Simonen, both of Princeton, all of N.J., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 18, 1970, Ser. No. 12,310
Int. Cl. G21b *1/00*
U.S. Cl. 176—5 **4 Claims**

Method and apparatus for dynamic stabilization of plasma instabilities for improving plasma confinement and for increasing plasma density independent of the phase of the instabilities. The method comprises confining the plasma column between ionizing plates which supply energetic particles to the plasma in a direction parallel to the axis of the plasma column and interacting the plasma in a predetermined direction with externally supplied radio-frequency



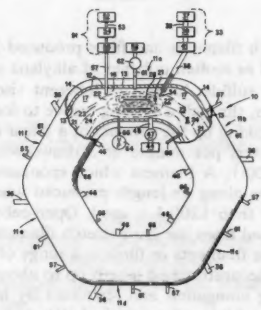
fields having a selectively variable power level amplitude and a sufficiently high frequency range.

3,668,067

POLYGONAL ASTRON REACTOR FOR PRODUCING CONTROLLED FUSION REACTIONS

Nicholas C. Christofilos, Hayward, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 16, 1969, Ser. No. 867,035
Int. Cl. G21b *1/02*
U.S. Cl. 176—5 **10 Claims**



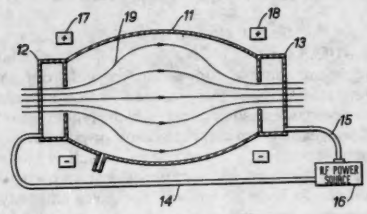
An Astron reactor including a plurality of linear magnetic field regions joined by intervening curved magnetic fields and arranged in a polygonal configuration. Energetic charged particles are introduced and trapped in the linear sections to form cylindrical sheaths, i.e., E-layers, of charged particles rotating about the axis of each section with the magnetic field thereof interacting with the linear magnetic regions to produce a closed system of magnetic field lines defining a containment zone for charged particles. Fuel materials introduced into the field are ionized and heated to form a high temperature plasma trapped in said zone. The ratio of the lengths of the linear and curved field regions is regulated to offset Bohm diffusion losses. A high molecular weight initiator plasma may also be introduced to heat the fuel to fusion temperatures.

3,668,068

PLASMA CONFINEMENT APPARATUS

Christopher John Hamilton Watson, Merton College, Oxford, England, assignor to United Kingdon Atomic Energy Authority, London, England

Filed Jan. 21, 1969, Ser. No. 792,573
Claims priority, application Great Britain, May 22, 1968, 24,456/68
Int. Cl. G21b *1/00*
U.S. Cl. 176—7 1 Claim



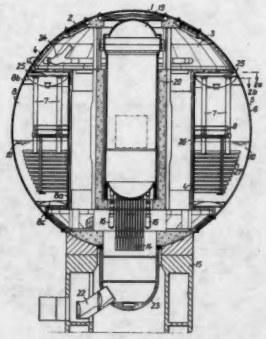
Loss of plasma from the loss regions of a static magnetic field confinement system is reduced by localizing in the loss region a radio frequency electromagnetic radiation which is nearly but not exactly in resonance with the ion cyclotron frequency and is arranged to reflect back into the confined plasma ions moving out of the static magnetic field through the loss regions.

3,668,069

PRESSURE SUPPRESSION CONTAINMENT FOR A LIQUID-COOLED NUCLEAR REACTOR

Walter Ullrich, Neu-Isenburg; Karl-Heinz Lohse, Frankfurt am Main; Jochen Leuteritz, Bruchkobel; Gunter Zeitzschel, Frankfurt am Main, and Robert Fassl, Munich, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 9, 1968, Ser. No. 766,049
Int. Cl. G21c *9/00*
U.S. Cl. 176—38 16 Claims



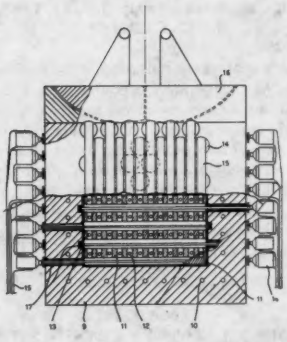
Containment apparatus and a pressure suppression system for a liquid-cooled nuclear reactor. The apparatus includes a safety container formed by a spherical pressure shell and a condensation chamber filled with water arranged within the safety container. The condensation chamber, which is annular in shape, is bounded on the outside by the safety container, on the inside by a cylindrical wall within the container, and at the top and bottom by annular ends respectively connecting the top and the bottom of the cylinder with the safety container. A plurality of condensation tubes are provided to pass through the upper end and extend into the water in the condensation chamber. The reactor pressure vessel of the nuclear reactor is located within the cylindrical wall and surrounded by a cylindrical biological shield. The diameter of the shield is less than the diameter of the cylindrical wall so as to form an annular passageway between the shield and the cylindrical wall from the calotte-shaped region of the safety container above, to the calotte-shaped region of the safety container below, the condensation chamber.

3,668,070

NUCLEAR REACTOR WITH HEAT PIPES FOR HEAT EXTRACTION

Peter Fiebelmann, Besozzo, and Helmut Neu, Travedona, both of Italy, assignors to European Atomic Energy Community (Euratom), Brussels, Belgium

Filed May 12, 1969, Ser. No. 823,681
Claims priority, application Germany, May 21, 1968, P 17 64 347.9
Int. Cl. G21k *14/00*
U.S. Cl. 176—40 3 Claims



A nuclear reactor with a heat extraction system comprising two groups of heat pipes which extend through the reactor core and which deliver heat to heat sinks disposed outside the core. All pipes of one group being parallel, the two groups are arranged in a mutual right angle relation and they intersect each other.

3,668,071

PROCESS FOR PRODUCING INOSINE

Takashi Nara, Tokyo; Masanaru Misawa, Kawasaki-shi, and Toshio Komuro, Machida-shi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of application Ser. No. 565,105, July 14, 1966, now abandoned. This application July 12, 1968, Ser. No. 744,295
Claims priority, application Japan, July 20, 1965, 40/43402
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N 12 Claims

An improvement in a fermentation process for producing inosine. A microorganism belonging to Brevibacterium or Corynebacterium is cultured in an aqueous nutrient medium containing hypoxanthine or natural substances containing the same.

3,668,072

FERMENTATION PROCESS FOR THE PRODUCTION OF L-ORNITHINE

Kunio Ando, Kawasaki-shi, and Hideo Oishi, Tokyo, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of application Ser. No. 724,299, Feb. 5, 1968, now abandoned , which is a continuation of application Ser. No. 469,307, July 2, 1965, now abandoned. This application Jan. 2, 1969, Ser. No. 788,659

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 4 Claims

L-ornithine can be produced by cultivating an auxotrophic mutant of Escherichia coli which requires arginine or citrulline, but not ornithine for the growth in a cultivation medium containing assimilable carbon, nitrogen sources, inorganic ions and arginine or citrulline, phosphate ion of said medium being limited to about 0.5 – 3.5μ mole/ml, under aerobic condition.

3,668,073

PREPARATION OF L-LEUCINE BY FERMENTATION

Sumio Kurihara; Kazumi Araki; Hiroyuki Ueda, and Masahiko Ikumo, all of Hofu-shi, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha

Filed Jan. 9, 1969, Ser. No. 790,177

Claims priority, application Japan, Jan. 11, 1968, 43/1089

Int. Cl. C12b *1/00*

U.S. Cl. 195—29 7 Claims

L-leucine is prepared by culturing a L-leucine-producing microorganism of the genus Corynebacterium in a culture medium containing a carbon source, a nitrogen source, inorganic material, nutrients and an isoleucine, methionine, phenylalanine or valine promoter. Mixtures of the promoters may also be employed. *Corynebacterium glutamicum* ATCC 21,301 and 21,335 are particularly suitable microorganisms for use in the process. L-leucine is an essential amino acid and is useful as a nutrient additive in food and feedstuffs for human and animals, respectively.

3,668,074

PROCESS FOR ISOLATION BY CRYSTALLIZATION OF THE MO-FE PROTEIN OF THE ENZYME NITROGENASE

Richard Charles Burns, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1969, Ser. No. 885,909

Int. Cl. C07g *7/02*

U.S. Cl. 195—62 6 Claims

Disclosed is a process for obtaining crystals of the Mo-Fe protein fraction of the enzyme nitrogenase. This fraction is essential in the fixation of atmospheric nitrogen by certain microorganisms.

3,668,075

GROWTH INHIBITIONS OF SELECTIVE MYCOPLASMAS

Thomas Cekoric, Jr.; George Evans, both of Hopatcong, and Ronald Searcy, Upper Montclair, all of N.J., assignors to Hoffman-LaRoche, Inc., Nutley, N.J.

Continuation-in-part of application Ser. No. 676,976, Oct. 20, 1967, now abandoned. This application Oct. 4, 1968, Ser. No. 765,028

Int. Cl. C12k *1/06*

U.S. Cl. 195—103.5 10 Claims

The use of certain heparinoid compounds to selectively inhibit the growth of mycoplasmas is described.

The invention provides a practical means for facilitating the selective identification of mycoplasmas. The identification of mycoplasmas isolated from man is especially useful as a diagnostic aid in prescribing treatment for diseases caused by these microorganisms.

Additionally, the invention provides a means of preventing the growth of mycoplasmas in culture media especially media used for tissue cultures in which mycoplasmas frequently occur as undesirable contaminants.

3,668,076

DIAGNOSTIC AGENT

Hans-Georg Rey; Hans Wielinger, and Peter Rieckmann, all of Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

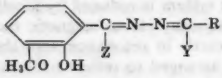
Filed June 17, 1969, Ser. No. 834,178

Claims priority, application Germany, July 15, 1968, P 17 73 839.5

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R 9 Claims

Diagnostic agent suitable for use in carrying out rapid analytical determinations of the presence and/or concentration of hydroperoxides, substances which react with the liberation of hydrogen peroxide, peroxidase or peroxidate active substances, comprising a chromogen which is oxidized by hydroperoxide in the presence of peroxidase or peroxidate active substances to form a dyestuff, the color intensity of which is dependent on the quantity of peroxide, peroxidase or peroxidate active substance present in the test sample, wherein the chromogen is a compound having the formula:



wherein Y is hydroxyl, mercapto, or amino, Z is hydroxyl, wherein Y AND Z together can represent oxygen, and R is hydrogen, mercapto, amino, lower alkyl, pyridino, morpholino, piperazinyl, arylpiperazinyl, phenyl, or phenyl substituted by one or more of hydroxyl, nitro, alkyl or alkoxyl.

3,668,077

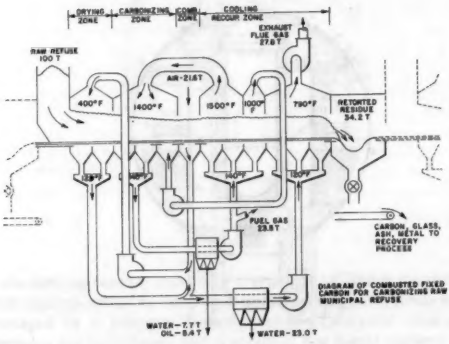
PROCESS FOR CONVERSION OF MUNICIPAL WASTE

Thomas E. Ban, South Euclid, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed June 19, 1970, Ser. No. 47,713

Int. Cl. C01b *49/06*

U.S. Cl. 201—29 10 Claims



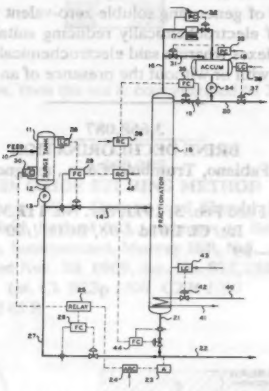
There is provided a process for treating municipal solid waste or the like characterized by disposing such material as a burden on a traveling grate, passing hot gases through the burden to carbonize carbonizable fractions thereof, and separating gas-entrained materials, e.g. water and organic materials, from the gases issuing from the burden. The unvolatilized solid material is composed largely of glass and metallics which may be further processed as desired. The process is characterized in that it is adaptable to continuous treatment of solid waste material, e.g. rubbish.

3,668,078

FRACTIONAL DISTILLATION BYPASS CONTROL PROCESS

Eric O. Holland, Borger, Tex., assignor to Phillips Petroleum Company

Filed Apr. 25, 1969, Ser. No. 819,145
Int. Cl. B01d 3/42
U.S. Cl. 203—3 5 Claims



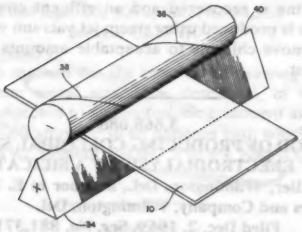
The composition of the overhead or bottoms product of a distillation is analyzed and a portion of the feed is passed directly to a recovery step when an analyzer output indicates a predetermined composition of the overhead or bottoms product.

3,668,079

ELECTROLYTIC RECORDING MEDIUM

Arthur S. Diamond, Palos Verdes Peninsula, and David E. Carr, Playa Del Rey, both of Calif., assignors to Telautograph Corporation, Los Angeles, Calif.

Filed May 13, 1971, Ser. No. 142,902
Int. Cl. B21h 1/20
U.S. Cl. 204—2 12 Claims



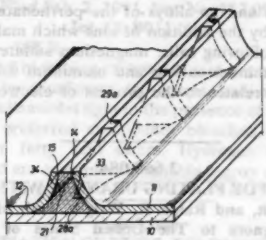
An improved electrolytic recording medium for use with dissolving electrode type of facsimile recording apparatus is disclosed comprising a porous sheet impregnated with an aqueous medium including a marking compound, an electrolyte and an effective amount of a compatible, fluorescent brightening agent.

3,668,080

METHOD OF PRODUCING SEPARATING NOZZLES

Klaus Weber, Pforzheim; Erwin Becker, Karlsruhe, and Werner Grosstuck, Pforzheim, all of Germany, assignors to Klaus D. Weber, Pforzheim, Germany

Filed Feb. 18, 1970, Ser. No. 12,265
Claims priority, application Germany, Feb. 21, 1969, P 19 08 693.2
Int. Cl. C23b 7/02; B21d 53/00; B01d 57/00
U.S. Cl. 204—9 30 Claims



A method of producing separating nozzles with slot-shaped nozzle-channels of a very high degree of accuracy for separating gaseous or vaporous substances into particles of different molecular weights, this method consisting of first producing a thin molding bar which consists of a material which may be easily melted or chemically dissolved and is made of a size and shape exactly corresponding to those of the inner surfaces of two walls of the nozzle channel which consist of strips of a very thin sheet metal which are applied upon and thus molded to the shape of this bar. Small partitions of sheet metal are also inserted into the molding bar which, when the nozzle walls are completed and the material of the molding bar is completely removed, remain between and thereby reinforce the nozzle walls.

3,668,081

PRODUCTION OF ELECTROLYTIC METAL

William Gerard Borner, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 17, 1971, Ser. No. 125,423
Int. Cl. C23b 7/02; B01k 1/00; C23b 7/00
U.S. Cl. 204—12 12 Claims

Metals such as nickel are electroformed upon a matrix or mandrel having an epoxy resist pattern thereon to provide foraminous or dividable electrodeposited metal separable from the matrix wherein the matrix is prepared by depositing from 2 to 30 microinches of standard chromium thereon and the desired resist pattern is applied to the chromium-plated surface in the form of a thermoset epoxy ink or paint containing dicyandiamide as a heat-curing agent and then heat curing the resist pattern to provide a repeatedly reuseable matrix.

3,668,082

METHOD FOR STRONGLY ADHERING A METAL FILM ON EPOXY SUBSTRATES

Glenn V. Elmore, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,939
Int. Cl. C23b 5/64
U.S. Cl. 204—30 7 Claims

An epoxy board is prepared for metal plating by dipping the same in a molten eutectic comprising 60% KOH and 40% NaOH. The epoxy board is then rinsed and neutralized, after which it is sensitized and activated conventionally and immersed in an electroless deposition bath for metal plating thereon. The resultant metal film is found to be strongly bonded to the epoxy board.

3,668,083

PROCESS OF ELECTROPLATING RHENIUM AND BATH FOR THIS PROCESS

Andre Meyer, Geneva, Switzerland, and Donald Gardner Foulke, Passaic, N.J., assignors to Sel-Rex Corporation, Nutley, N.J.

Continuation of application Ser. No. 739,165, June 24, 1926, now abandoned. This application Oct. 27, 1970, Ser. No. 84,505

Claims priority, application Switzerland, July 3, 1967, 9470/67

Int. Cl. C23b *5/32, 5/24*

U.S. Cl. 204—43 10 Claims

The invention relates to a bath for electrodepositing low-stress rhenium and its alloys of the perrhenate type and is characterized by the addition of ions which make up one or more of the following salts: magnesium sulfate, magnesium sulfamate, aluminum sulfate and aluminum sulfamate. The invention also relates to the process of electroplating from said bath.

3,668,084

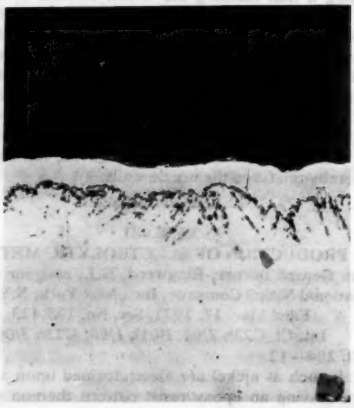
PROCESS FOR PLATING URANIUM WITH METAL

George S. Petit, and Ralph R. Wright, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 10, 1970, Ser. No. 45,085

Int. Cl. C01g *43/00*

U.S. Cl. 204—1.5 7 Claims



A process for providing a uranium metal article with a tenaciously adhering metal plating deposited from aqueous solution. Prior to plating, oxides and other contaminants are removed from the surface of the article. The article then is heated in vacuum under selected conditions to form thereon a very thin and highly protective oxide film which is non-wettable by water. The surface of the oxide-coated article is made wettable by water by contacting the article with a basic wetting solution. The resulting wettable, oxide-coated article is then electroplated with metal in an aqueous metal-plating bath.

3,668,085

METHOD OF ELECTROLYTICALLY COATING LEAD DIOXIDE ON THE SURFACE OF VARIOUS MATERIALS

Shinzo Kiyohara, and Yasuichi Shibazaki, both of Yokohama, Japan, assignors to Isomura Sangyo Kaisha, Ltd., Tokyo, Japan

Filed Aug. 21, 1969, Ser. No. 852,074

Claims priority, application Japan, Aug. 24, 1968, 43/60211

Int. Cl. C23b *11/00*

U.S. Cl. 204—57 2 Claims

Lead dioxide is coated on the surface of a base electrode by electrolyzing an acidic aqueous lead nitrate solution containing a small amount of copper nitrate at a temperature not lower than 70° C. and with a current density of anode not higher than 4 A/dm².

3,668,086

ELECTROCHEMICAL GENERATION OF SOLUBLE NICKEL(O) CATALYSTS

William B. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 28, 1970, Ser. No. 59,018

Int. Cl. B01k *3/00*

U.S. Cl. 204—59 R 4 Claims

A method of generating soluble zero-valent nickel catalyst consisting of electrochemically reducing suitable nickel(II)-ligand complexes wherein said electrochemical reduction can be achieved with or without the presence of an electrolyte.

3,668,087

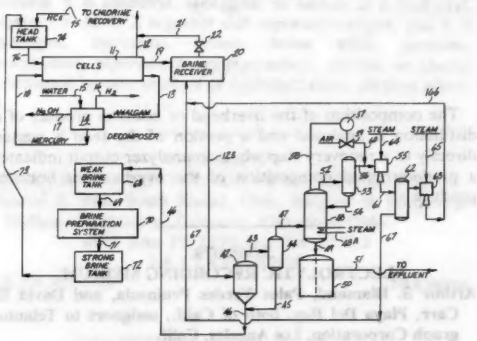
BRINE DECHLORINATION

Leonard A. Fabiano, Trumbull, Conn., assignor to Olin Corporation

Filed Feb. 3, 1971, Ser. No. 112,316

Int. Cl. C01d *1/08*; B01k *1/00*

U.S. Cl. 204—99 4 Claims



In the vacuum dechlorination of acidic alkali metal chloride brine effluent from a mercury cathode electrolytic cell, chlorine is recovered and an effluent environmentally acceptable is produced using steam jet vacuum with rectification to remove chlorine to acceptable amounts in the aqueous effluent.

3,668,088

METHOD OF PRODUCING COLLOIDAL SILICA BY ELECTRODIALYSIS OF A SILICATE

Ralph K. Iler, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

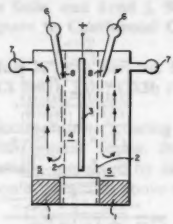
Filed Dec. 2, 1969, Ser. No. 881,371

Int. Cl. B01k *1/00*

U.S. Cl. 204—101 4 Claims

Silica sol is made by electrodialysis of a solelectrolyte containing an aqueous silica sol, aqueous sodium or potassium silicate, and a supplementary electrolyte such as sodium or potassium carbonate or sulfate. Temperature is maintained at 50° to 100° C. A source of non-siliceous anion is added as needed to maintain normality of the supplementary electrolyte between 0.01 and 0.15, and silicate is added as necessary to maintain pH between 8.0 and 9.5. After the electrodi-

alysis, most of the sodium ions and the anions of the supplementary electrolyte are removed by treatment with ion



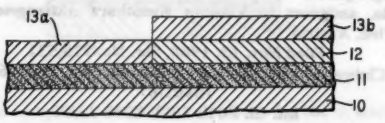
exchange resins, then the sol is concentrated to 30 or 40 percent silica.

3,668,089

TIN OXIDE ETCHING METHOD

Eugene W. Chase, West Orange, and Harold J. Robinson, South Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 10, 1969, Ser. No. 875,258
Int. Cl. B23p 1/00; C23f 1/00
U.S. Cl. 204—143 R **4 Claims**



Tin oxide (SnO_2) is etched by forming a layer of a metal such as aluminum on the portions of the SnO_2 surface to be etched, and then contacting the metal with an aqueous solution of hydrochloric acid. Passage of a current through the tin oxide-metal composite as cathode while in contact with the solution as electrolyte may be employed to speed up removal of SnO_2.

3,668,090

METHOD FOR THE ELECTROLYTIC REMOVAL OF DRAWING OR ROLLING LUBRICANTS ON STEEL STRANDS

Richard L. Sallo, Greensburg, and Charles D. Stricker, Monroeville Borough, both of Pa., assignors to United States Steel Corporation

Filed Apr. 20, 1970, Ser. No. 30,358
Int. Cl. C23b 1/04
U.S. Cl. 204—145 R **5 Claims**

A one-step method for the removal of drawing or rolling lubricants from metal strands is described, in which the strands are subjected to an electrolytic treatment at a current density of 30–60 amps/in² in an aqueous bath which contains about 6 to 16 wt. percent NaOH, .5 to 6% $Na_4P_2O_7$ and .5 to 5% Na_2CO_3.

3,668,091

ULTRAVIOLET LIGHT BLEACHING OF CARBOXYLIC ACID ESTERS AND EPOXY COMPOUNDS

William H. French, St. Paul, and Oliver A. Ossanna, Bloomington, both of Minn., assignors to Ashland Oil, Inc., Houston, Tex.

Filed Feb. 2, 1971, Ser. No. 112,067
Int. Cl. B01j 1/10
U.S. Cl. 204—158 R **17 Claims**

A process of bleaching carboxylic acid esters and/or epoxy compounds by irradiating the esters and/or epoxy compounds with ultraviolet light in the presence of ketone. The preferred compounds bleached are the epoxidized higher fatty acid esters. Benzophenone, acetophenone, and acetone are examples of some suitable ketones.

3,668,092

BLEACHING OF CARBOXYLIC ACID ESTERS AND/OR EPOXY COMPOUNDS EMPLOYING ULTRAVIOLET LIGHT

William H. French, St. Paul, and Oliver A. Ossanna, Bloomington, both of Minn., assignors to Ashland Oil, Inc., Houston, Tex.

Filed Feb. 2, 1971, Ser. No. 112,088
Int. Cl. B01j 1/10
U.S. Cl. 204—158 R **16 Claims**

A process of bleaching carboxylic acid esters and/or epoxy compounds by irradiating the esters and/or epoxy compounds with ultraviolet light in the presence of a peroxy compound. The preferred compounds bleached are the epoxidized higher fatty acid esters. Hydrogen peroxide and peracetic acid are examples of suitable peroxy compounds.

3,668,093

PHOTOINITIATION OF VINYL POLYMERIZATION BY TRIAROYLPHOSPHINES

Thomas Albert Rettig, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1971, Ser. No. 140,987
Int. Cl. C08d 1/00; C08f 1/16
U.S. Cl. 204—159.23 **13 Claims**

Acyl phosphines of the formula

$$R^2—\overset{R^1}{\underset{|}{P}}—R^3$$

wherein R^1, R^2 and R^3, alike or different, are aryl or aroyl groups having up to 13 carbon atoms and such aryl or aroyl groups substituted with halogen of atomic number 9–35, alkyl of up to six carbon atoms, or alkoxy of up to six carbon atoms, with the proviso that at least one of R^1, R^2 and R^3 is aroyl, are effective as photoinitiators for photopolymerization of ethylenically unsaturated compounds. Compositions containing such an acyl phosphine and an ethylenically unsaturated compound are useful in preparing photoimaging compositions, adhesives, coating compositions and the like.

3,668,094

NOVEL GLASSY COMPOSITIONS ZINC AND ALPHA HYDROXY DIPHOSPHONIC ACIDS

George Birdseye Hatch, Allison Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1970, Ser. No. 81,559
Int. Cl. C02b 5/06; C23f 11/16, 14/02
U.S. Cl. 252—180 **11 Claims**

Novel alkali metal zinc and ammonium zinc glasses of alpha hydroxy diphosphonic acids are disclosed along with the use of these glassy compositions in small concentrations to inhibit corrosion and scale formation in aqueous systems.

3,668,095

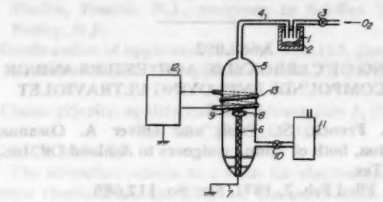
METHOD OF MANUFACTURING A METALLIC OXIDE FILM ON A SUBSTRATE

Hisao Katto; Kazunari Kobayashi, both of Hachioji; Yasushi Koga, Mitaka, and Machiko Koyama, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1970, Ser. No. 22,908
Claims priority, application Japan, Mar. 31, 1969, 44/23791; Feb. 16, 1970, 45/12660
Int. Cl. B01k 1/00; B32b 15/04; B32f 17/00; B32b 15/04; B22b 17/00
U.S. Cl. 204—164 **15 Claims**

A method for manufacturing a thin, highly pure metallic oxide film by the use of glow discharge on a substrate includ-

ing the steps of preparing a mixture gas of oxygen and a metallic halide with controlled pressure in an evacuated chamber into which a substrate is placed, applying a high al-



ternating electrical field of a frequency higher than 1 KHz to the chamber to produce the glow discharge adjacent to the substrate, thereby causing the required chemical reaction for the formation of the metallic oxide.

3,668,096

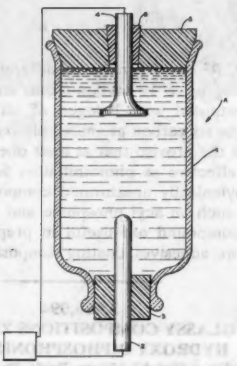
METHOD AND APPARATUS FOR CONTROLLING POLYMERIZATION REACTIONS

William H. Cook, Upper Montclair, N.J., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 13, 1968, Ser. No. 775,236

Int. Cl. B01k *1/00*

U.S. Cl. 204—165 **5 Claims**



A technique is disclosed for initiating and accelerating the reaction of polymerizable media, particularly thermosetting materials, through application of a suitably imposed electric field under conditions which lead to electrokinetic activity in filled systems. The process greatly facilitates the preparation of composites by permitting long gel time and rapid cure.

3,668,097

METHOD FOR TREATING SURFACES OF WORK PIECES TO IMPROVE THE ADHESION OF PRINTING INKS AND ADHESIVES THERETO

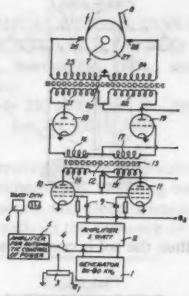
Axel Verner Eisby, Carl Ploughsvej, Kolding, Denmark

Continuation-in-part of application Ser. No. 572,959, Aug. 17, 1966, now abandoned. This application Apr. 15, 1969, Ser. No. 816,369

Int. Cl. B01k *1/00*

U.S. Cl. 204—165 **7 Claims**

The invention relates to a method for treating plastic work pieces, in general, and foil surfaces, in particular, to improve the adhesion of printing inks to at least one of the foil surfaces and wherein the foil is passed over a counter electrode and is subjected to electric high-frequency voltages having a



frequency of 20–80 kc transmitted to the foil by means of electrodes directed towards its surface.

3,668,098

COATING COMPOSITIONS

Wolfgang Daimer, and Heinrich Lackner, both of Graz, Austria, assignors to Vianova Kunstharz Aktiengesellschaft, Wien, Austria

Filed Nov. 13, 1968, Ser. No. 775,531

Claims priority, application Austria, Nov. 20, 1967, A 10401/67

Int. Cl. B01k *5/00*; C23b *13/00*

U.S. Cl. 204—181 **10 Claims**

A water-dilutable coating composition particularly adaptable for electro-deposition comprising water, a water-miscible solvent, and an ammonia or amine soap of a condensation product of an adduct of an α,β-ethylenically unsaturated dicarboxylic acid and an ester of a hydroxyl-free drying or semi-drying oil, unmodified or modified with rosin, is described. The condensation product will comprise from 10 to 25 percent by weight of a dienophilic compound, 75 to 90 percent by weight of the hydroxyl-free ester of a drying or semi-drying oil prepolymerized to a viscosity 3 to 30 times its initial value.

3,668,099

APPARATUS FOR MEASURING OXYGEN CONTENT OF A FLUID

Robert S. Rittiger, Allegheny Township, and Charles K. Russell, Franklin Township, both of Pa., assignors to United States Steel Corporation

Filed Feb. 16, 1971, Ser. No. 115,509

Int. Cl. G01n *27/30*

U.S. Cl. 204—195 S **12 Claims**

Apparatus for measuring oxygen content of fluids at elevated temperatures includes a sensor or probe which comprises a Cr_2O_3 tube and a solid electrolyte button sealing that end of the tube that contacts the fluid. A solid oxygen reference material in the tube made of chromium or a chromium alloy contacts the button and the other end of the tube is sealed with a molybdenum cap. A thermocouple and a lead wire pass through the cap into the tube. A quartz tube surrounds the Cr_2O_3 tube and button with its outer end in sealing engagement with the button. An electronic conductor has one end extending into the fluid. In one embodiment the conductor is a tube surrounding the quartz tube and in another it is a separate rod or tube. In both embodiments the conductor is preferably a mixture of Al_2O_3 and molybdenum. The lead wire and the other end of the conductor are connected to a voltage measuring means.

3,668,100
ELECTROPHORETIC COATING OF METAL SUBSTRATES USING ELEVATED PRESSURES

Lincoln J. Frost, La Salle, and Arnd J. Stadler, Park Forest, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

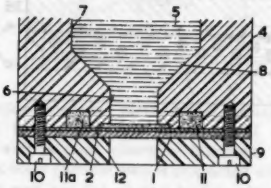
Filed July 1, 1970, Ser. No. 51,692
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 5 Claims

In a process of electrophoretic coating of electrically conductive surfaces with organic resins, the amount of resin deposited is substantially increased by conducting the electrophoretic deposition at pressures above atmospheric.

3,668,101
MEMBRANE ELECTRODES AND CELLS

Imanuel Bergman, Sheffield, England, assignor to National Research Development Corporation, London, England

Filed July 22, 1968, Ser. No. 746,436
Int. Cl. G01n 22/46
U.S. Cl. 204—195 2 Claims

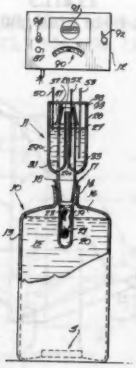


A three component membrane electrode for use in electrical cells having in sequence, a gas-permeable membrane, an electrically conductive layer and a protective layer acting as a diffusion barrier to gas dissolved in the electrolyte. The gas permeable membrane preferably is a plastic material and the electrically conductive layer is preferably laid down on the gas permeable membrane in the form of minute non-coalescing globules of gold and/or silver.

3,668,102
SYSTEM FOR MEASURING BOD BY ELECTROLYSIS

James C. Young, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 13, 1969, Ser. No. 849,742
Int. Cl. G01n 27/46
U.S. Cl. 204—195 B 9 Claims

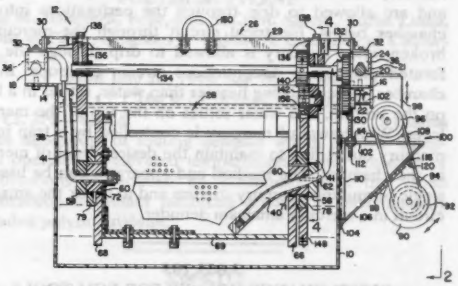


A system for measuring BOD by the electrolysis method has a reaction vessel containing the sample. A container of material for absorbing CO_2 is received in the mouth of the vessel and is provided with an adaptor. An electrolysis cell storing the electrolyte is received in the adaptor. A cap is placed on the electrolysis cell with an upper circular covering flange spaced from the walls of the cell thus providing an annular space communicating with the electrolyte to permit venting of hydrogen while minimizing evaporation of the electrolyte. When the level of the electrolyte falls below a predetermined minimum, indicating a low O_2 pressure in the vessel, a sensing switch energizes a regulated dc current source to start the electrolysis process to replace the O_2 consumed by the sample. The system is insensitive to changes in line voltage and electrolyte strength over a design range. Apertures in the cap member and the cell may be selectively aligned by twisting the cap to equalize the pressure in the cell with atmospheric pressure before starting.

3,668,103
HANGER BRACKET AND DRIVING APPARATUS FOR PLATING BARRELS

Albert Singleton, 7360 Brookside Parkway, Middleburg Heights, Ohio

Filed Nov. 20, 1970, Ser. No. 91,394
Int. Cl. C23b 5/78
U.S. Cl. 204—213 10 Claims

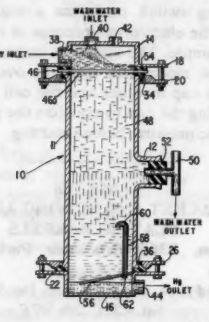


The specification and drawings disclose a plating barrel assembly which comprises a barrel member mounted for rotation about its longitudinal axis. The barrel is supported from generally vertically extending hangers formed from metal reinforced plastic and are carried by a horizontally extending frame adapted to removably rest on the upper edge of the plating tank. Means are provided for rotating the barrel and the means include a shaft rotatably carried on the horizontal frame and connected through a gear train with a gear connected to an end of the drum. At least one end of the horizontal shaft extends outwardly of the frame for releasable engagement with a drive assembly. The drive assembly is mounted on one end of the plating tank and includes a first support frame mounted for vertical adjustment and including a horizontally extending portion and an inclined portion. A motor is adjustably mounted on the inclined portion and is drivingly connected with a gear reducer unit carried on the horizontal portion. The gear reducer is positioned with its output shaft extending horizontally and carrying a gear adapted to releasably engage a gear on the shaft member. The entire drum assembly has a low total height so that it can be easily lifted from the plating tank.

3,668,104
DRIPPING MERCURY CIRCUIT BREAKER

Richard E. Loftfield, Chardon; Warren R. Bailey, Painesville, both of Ohio, and John C. Doolittle, Jr., Houston, Tex., assignors to Oronzio De Nora Impianti Elettrochimici, S.A.A., Milan, Italy

Filed Sept. 17, 1969, Ser. No. 858,580
Int. Cl. B01k 3/04
U.S. Cl. 204—279 11 Claims

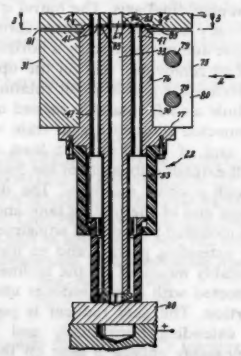


A circuit breaker for fluent electrical conductors, such as mercury, which consists of a chamber with a perforated plate at the top, a mercury and water inlet, a mercury outlet at the bottom and a water outlet located at an intermediate point. Mercury and water are introduced onto the perforated plate and are allowed to drip through the perforations into the chamber below. Electrical circuit through the mercury is broken when mercury is allowed to drip through the perforated plate in a discontinuous stream of drops. In the chamber, mercury being heavier than water, settles in a layer on the bottom, and water settles on the top of the mercury layer. Withdrawal of mercury is controlled by a trap in the mercury outlet line to maintain the desired level of mercury in the chamber. The method and apparatus can be used on single or multiple mercury streams and to break the amalgam circuit in a mercury amalgam denuder.

3,668,105
QUICK-CHANGE HOLDER FOR ECM TOOLS

Ronald C. Abt, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Original application Dec. 19, 1968, Ser. No. 785,226, now Patent No. 3,594,298. Divided and this application Mar. 12, 1971, Ser. No. 123,564
Int. Cl. B23p 1/00; C23b 5/70; B23r 9/16
U.S. Cl. 204—297 R 4 Claims

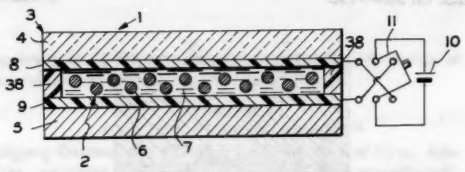


A cavity is provided in the platen of an ECM machine for receiving the mounting portion of the electrode tool. Part of the cavity takes the form of an arm extending around the tool for clamping it in the cavity. The tool is thereby held accurately in place on the platen and a large area of contact is provided between the tool and the platen for efficiently conducting the heavy machining current which flows therethrough during machining operations. Means is also provided for effecting a fluid-tight seal between the machining fluid passages in the tool and the corresponding passages in the platen when the tool is inserted in the cavity. This prevents machining fluid from entering the interface between the tool and the cavity and corroding the joint through which the machining current must flow.

3,668,106
ELECTROPHORETIC DISPLAY DEVICE

Isao Ota, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 9, 1970, Ser. No. 26,874
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—299 25 Claims

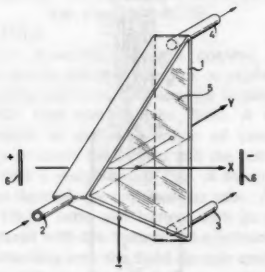


An electorphoretic display and/or recording device in which an electrophoretic suspension layer including a dispersion of at least one electrophoretic material in a finely divided powder form suspended in a suspending medium is interposed between a pair of electrodes. An electric field is imposed across the electrophoretic suspension layer to change the optical reflective property of the suspension layer by changing the spatial distribution of the electrophoretic material in the suspending medium electrophoretically.

3,668,107
DIAPHRAGM CELL FOR THE ELECTROPHORESIS OF SUBSTANCE MIXTURES

Franz Lappe, Hofheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Mar. 10, 1970, Ser. No. 18,128
Claims priority, application Germany, Mar. 17, 1969, P 19 13 411.3
Int. Cl. B01d 13/02; B01k 5/00
U.S. Cl. 204—301 3 Claims

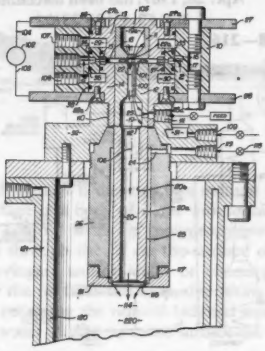


For the electrophoresis of electrically charged particles in a solvent mixture diaphragm cells are used which are characterized by a special arrangement of the inlet and outlet openings.

3,668,108
SOLIDS ARC REACTOR APPARATUS AND METHOD

John Houseman, Newport Beach, Calif., assignor to Hercules Incorporated, New Castle County, Del.

Original application Nov. 15, 1966, Ser. No. 594,598, now Patent No. 3,533,756. Divided and this application June 20, 1969, Ser. No. 843,273
Int. Cl. C22d 7/08
U.S. Cl. 204—323 12 Claims

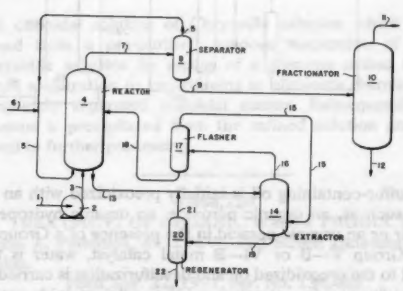


This invention concerns method and apparatus useful in carrying out hot plasma gas treatment of divided solid materials as well as other chemical reactions. According to the process, a solid particle feed is contacted with hot plasma gas, the food and gas are caused to flow through an elongated residence zone under conditions such as to enhance vaporization of the feed, and the vaporized feed is condensed in the form of a finely divided powder product. The apparatus includes anode and cathode elements forming passages for reception of an arc discharge pattern penetrating these elements end of passing gas flow through one element while blocking gas flow through the other element, together with means to establish the arc discharge pattern. The structure typically forms an elongated vaporization zone to receive the feed and gas from the one element, and being of sufficient length to assure enchanced vaporization of the feed in that zone.

3,668,109
PROCESS FOR HYDROCONVERSION OF ORGANIC MATERIALS

Thomas E. Kiovsky, El Sobrante, and Milton M. Wald, Walnut Creek, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,203
Int. Cl. C10g 1/06, 13/02
U.S. Cl. 208—10 5 Claims



A process for hydroconversion or organic materials, particularly solid or very high boiling organic materials, by contacting such materials under hydrogen pressure and at elevated temperature with a continuous liquid phase catalyst containing gallium trichloride, gallium tribromide, gallium triiodide, mercuric bromide, mercuric iodide, stannic bromide, stannic iodide, stannous chloride, stannous bromide, stannous iodide, zirconium tetrachloride, zirconium tetrabromide, zirconium tetraiodide, titanium tetrabromide, titanium tetraiodide, titanium triiodide, cuprous chloride, cuprous bromide, cuprous iodide, hafnium tetrachloride, hafnium tetrabromide, or hafnium tetraiodide.

3,668,110
PITCH TREATMENT MEANS

Frederick L. Shea, 806 Wedgewood Rd.; Louis A. Joo, 208 Chicksaw Dr., both of Johnson City, Tenn., and Thomas W. Martin, P.O. Route 6, Elizabethton, Tenn.

Filed Oct. 28, 1970, Ser. No. 84,883
Int. Cl. C01b 1/07; C10c 3/08
U.S. Cl. 208—45 6 Claims

A spinnable pitch, useful in the manufacture of carbon filaments of continuous lengths, is prepared by the multiple solvent extraction of pitch, first by trituration of pitch particles with a low-boiling, aromatic solvent in which the bulk of pitch particles is essentially insoluble — then by dissolution of the pitch in a solubilizing solvent, filtration, and evaporation of the solvent.

3,668,111
FOULING RATE REDUCTION IN HEATED HYDROCARBON STREAMS WITH DEGRADED POLYISOBUTYLENE

Louis M. Dvoracek, Brea, and Amir M. Sarem, Yorba Linda, both of Calif., assignors to Union Oil Company of California

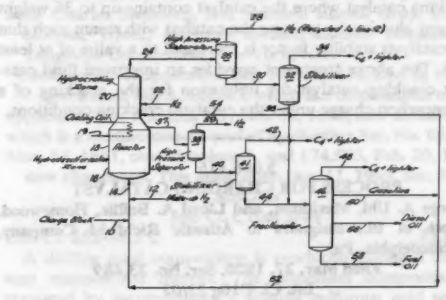
Filed July 16, 1970, Ser. No. 55,594
Int. Cl. C10g 9/16, 9/36; C23f 14/00
U.S. Cl. 208—48 AA 8 Claims

The deposition of fouling deposits within process equipment operated at elevated temperatures in the presence of hydrocarbons is reduced by combining with the liquid hydrocarbon a foulant inhibiting amount of mechanically degraded polyisobutylene.

3,668,112
HYDRODESULFURIZATION PROCESS

Levi C. Parker, Port Arthur, and Odes B. Robertson, Groves, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 6, 1968, Ser. No. 781,788
Int. Cl. C10g 23/00
U.S. Cl. 208—89 4 Claims



Low sulfur diesel oil and low sulfur fuel oil are produced by a process which permits the minimum production of materials boiling in the gasoline range. A catalytic hydrodesulfurization process reduces the sulfur content of the portion of the feed charge which is subsequently fractionated into the desired diesel fuel and fuel oil. Hydrocar-

bons produced in the desulfurization process boiling within the motor fuel boiling range are catalytically cracked to yield substantial quantities of C_1 to C_4 hydrocarbons.

3,668,113

HYDROCATALYTIC PROCESS FOR NORMAL PARAFFIN WAX AND SULFUR REMOVAL

Bernard Whiting Burbidge, Leatherhead; Ian Montgomery Keen, Harrow, and Christopher Ronald Pout, Sunbury, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Sept. 22, 1969, Ser. No. 860,082
Claims priority, application Great Britain, Nov. 7, 1968, 52,813/68
Int. Cl. C10g *37/06*
U.S. Cl. 208—97 **5 Claims**

Hydrocarbon fractions, particularly petroleum fractions of 30–650° C boiling range and containing 0.1 – 3.0 percent wt. sulphur 5–50 percent wt. n-paraffin wax, are reduced in sulphur and n-paraffin wax content by hydrocatalytic treatment at 260°–482° C and 50–3,000 psig, first over a catalyst of a Group VI or VIII hydrogenating component on a mordenite of reduced alkali metal content to remove n-paraffin wax and then over a catalyst of a Group VI or VIII hydrogenating component and a refractary inorganic oxide to remove sulphur. Diesel fuels or fuel oils are separated from the desulfurized product.

Preferred catalysts are Pt on decationized mordenite and CoMo on alumina used respectively in amounts of 10–90 and 90–10 percent vol., preferably 20–60 and 80–40 percent vol. The feedstock must contact the mordenite catalyst first since this is sensitive to H_2S and if gas is recycled from the sulphur removal to the n-paraffin wax removal stage this should be treated to remove H_2S.

3,668,114

STABILIZED AMORPHOUS SILICA-ALUMINA CATALYTIC CRACKING CATALYSTS

William H. O'Keefe, Creve Coeur, Mo.; James H. Colvert, Houston; Gerald V. Nelson, Nederland, and Douglas J. Youngblood, Groves, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 728,617, May 13, 1968, now abandoned. This application Dec. 28, 1970, Ser. No. 102,238
Int. Cl. C10g *11/02*; B01j *11/40*
U.S. Cl. 208—120 **10 Claims**

There is provided a method for improving the attrition resistance and heat stability of a silica-alumina fluid catalytic cracking catalyst where the catalyst contains up to 35 weight percent alumina by treating the catalyst with steam such that the catalysts stability factor is increased to a value of at least 12.5. The above treatment provides an improved fluid catalytic cracking catalyst for utilization for the cracking of a hydrocarbon charge under the catalytic cracking conditions.

3,668,115

PROCESS FOR CHARGING CATALYST

George A. Uhl, Markham, and Lloyd A. Baillie, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 27, 1970, Ser. No. 23,489
Int. Cl. C10g *23/02*
U.S. Cl. 208—143 **24 Claims**

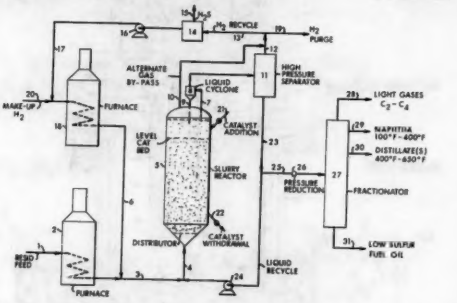
An improved process for charging a solid catalyst, such as an extruded catalyst, to a fixed bed reactor by charging the catalyst at a rate of fill of the reactor of up to about 17 inches per minute and in a manner such that the average orientation of catalyst particle lengths in the catalyst bed is substantially horizontal.

3,668,116

SLURRY HYDRODESULFURIZATION OF A HEAVY PETROLEUM OIL

Clark E. Adams, Baton Rouge, and William T. House, East Baton Rouge Parish, both of La., assignors to Esso Research and Engineering Company

Continuation of application Ser. No. 710,344, Mar. 4, 1968, now abandoned. This application Oct. 16, 1970, Ser. No. 81,541. The portion of the term of the patent subsequent to Apr. 28, 1987, has been disclaimed.
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 **17 Claims**



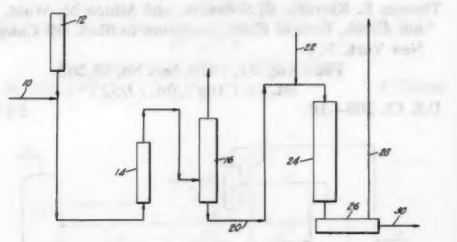
A heavy petroleum oil is treated in a slurry reactor with hydrogen and with a catalyst containing the oxide or sulfide of a Group VI B metal and the oxide or sulfide of a Group VIII metal deposited on a support of silica-stabilized alumina at reaction temp. of 600°–850° F and 500–5,000 psig. The catalyst is characterized by a maximum of catalyst surface area in pores having pore diameters of 30–70 Angstroms and a minimum of the total pore volume having diameters of over 100 Angstroms. The catalyst is employed in the hydrodesulfurization zone at a concentration of 15–45 pounds/cu.ft., preferably at a concentration of 20 to 30 pounds/cu.ft.

3,668,117

DESULFURIZATION OF A PREOXIDIZED OIL

Jitendra A. Patel, Beacon; Sheldon Herbstman, Spring Valley; Reese A. Peck, and Raymond F. Wilson, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 17, 1970, Ser. No. 20,286
Int. Cl. C10g *19/00*
U.S. Cl. 208—228 **3 Claims**

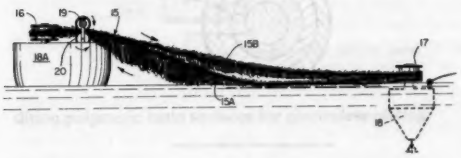


A sulfur-containing oil is initially preoxidized with an oxidant, such as, an organic peroxide, an organic hydroperoxide, air or an organic peracid in the presence of a Group IV—B, Group V—B or VI—B metal catalyst, water is then added to the preoxidized oil and desulfurization is carried out with sodium oxide, potassium oxide or calcium oxide catalyst on an alumina support. Water is added to the oil prior to desulfurization at a concentration ranging from 1 to 20 percent by weight.

3,668,118
OIL MOP AND METHOD OF USING SAME

Herbert M. Rhodes, New Orleans, La., assignor to Oil Mop International, Inc.

Filed July 6, 1970, Ser. No. 52,448
Int. Cl. E02b *15/04*
U.S. Cl. 210—30 9 Claims

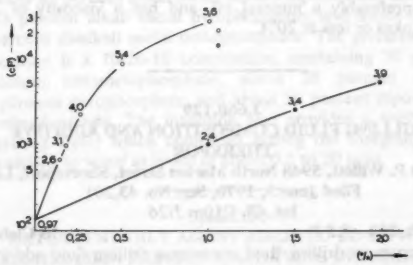


The present disclosure is directed to a method of removing oil from the surface of a body of water with an oil mop made of thin gauge narrow strips of polypropylene or similar material passed through the oil on the surface of water and then through wringers and/or water or chemical sprays or both to remove the oil from the mop, depositing the oil in a receptacle and returning the non-oil ladened mop back into the oil covered water to pick up more surface oil.

3,668,119
PROCESS FOR OBTAINING AN ASBESTOS-FIBER MATERIAL OF A HIGH DEGREE OF SEPARATION

Dietrich Bauer, Kahl, Main, and Helmut Fratzscher, Grossauheim, both of Germany, assignors to Deutsche Gold-und Silber-Scheidean-stalt Vormals Roessler, Frankfurt am Main, Germany

Filed Feb. 4, 1971, Ser. No. 112,680
Claims priority, application Germany, Feb. 5, 1970, P 20 05 226.0
Int. Cl. B01d *37/00*
U.S. Cl. 210—42 13 Claims



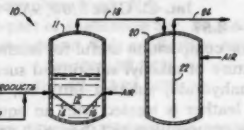
A colloidal solution of Chrysotile asbestos which is obtained from a pre-purified aqueous suspension of crude Chrysotile asbestos by means of a shearing action is subjected to filtration or centrifuging to eliminate therefrom incompletely separated colloidal matter. Subsequently, the asbestos is precipitated from the refined solution and subjected to further processing.

3,668,120
TREATMENT OF ORGANIC WASTE PRODUCTS

Wayne A. Patterson, 4932 N.W. 31st Street, Oklahoma City, Okla.

Filed Apr. 22, 1971, Ser. No. 136,435
Int. Cl. C02c *5/04*
U.S. Cl. 210—60 9 Claims

A process for the treatment of human organic waste products or the like whereby harmless inoffensive gases are produced. In the process, the organic waste products are combined with water to form a fine particle slurry. The slurry is introduced below the surface of a body of suitable molten metal contained in a primary combustion vessel to produce



carbon dioxide, water vapor and other gases. The carbon dioxide, water vapor and other gases are introduced into a heated secondary combustion vessel to further oxidize the gases and produce harmless, inoffensive gases which may be vented to the atmosphere.

3,668,121
INTUMESCENT FIRE-RETARDING COMPOSITION COMPRISING AMMONIUM DERIVATIVES OF GLYOXYLIC ACID

Philip X. Masciantonio, Penn Township, Westmoreland County, and Edward L. Mihelic, Penn Hills Township, Allegheny County, both of Pa., assignors to United States Steel Corporation

Filed Aug. 10, 1970, Ser. No. 62,721
Int. Cl. C09d *5/18*; C09k *3/28*
U.S. Cl. 252—8.1 7 Claims

Water-soluble mono- and diammonium derivatives of glyoxylic acid are prepared and used as intumescent fire-retarding and heat-insulating materials.

3,668,122
DRILLING FLUID PREPARATION

Claud D. Branscum, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Aug. 28, 1969, Ser. No. 853,937
Int. Cl. C10m *3/02*, *3/22*
U.S. Cl. 252—8.5 A 7 Claims

A method of preparing an improved drilling fluid of an inorganic salt and a carboxyalkylcellulose is disclosed in which the carboxyalkylcellulose is dissolved in the water and the inorganic salt is added to the solution thereafter.

3,668,123
DISPERSANTS FROM SPENT SULFITE LIQUOR

John Charles Steinberg, and Kenneth Russell Gray, both of Shelton, Wash., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Continuation of application Ser. No. 688,264, Dec. 5, 1967, now Patent No. 3,505,243, which is a continuation of application Ser. No. 432,761, Feb. 15, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 95,190, Mar. 13, 1961, now abandoned, and 174,595, Feb. 20, 1962, now abandoned. This application Dec. 11, 1969, Ser. No. 884,246
Int. Cl. C10m *3/48*
U.S. Cl. 252—8.5 C 2 Claims

A drilling mud composition is produced having a dispersant composition therein. The dispersant composition is prepared by incorporating a soluble sulfurous acid salt of sodium, potassium or ammonia into an aqueous solution containing soluble-base spent sulfite liquor. The spent sulfite liquor includes the reducing sugars from the sulfite pulping of wood. This solution is heated for a period of time sufficient to produce a product having a viscosity such that after complexing with a chromium salt it exhibits dispersant properties in drilling muds.

3,668,124

COMPOSITION AND METHOD FOR TREATING DRY-CLEANABLE SOIL-RESISTANT LEATHERS

Vincent Joseph Cassella, Jr., Audubon, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 13, 1970, Ser. No. 37,019
Int. Cl. C14c 5/00, 9/00
U.S. Cl. 252—8.57 5 Claims

A fat liquor composition useful for leather treatment comprises a mixture of alkenyl substituted succinic acid or succinic acid anhydride, sulfated fatty oil, and an amine or amide. The leather is treated with an aqueous emulsion of the fat liquor composition and then with an aqueous solution of the chromium coordination complex of perfluoroalkyl-containing carboxylic acid to provide a soil and water-repellent leather that is resistant to loss of lubricity when dry cleaned.

3,668,125

BLOCK COPOLYMERS AS VISCOSITY INDEX IMPROVERS FOR LUBRICATING OILS

William S. Anderson, Oakland, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1969, Ser. No. 884,720
Int. Cl. C10m 1/18
U.S. Cl. 252—59 6 Claims

Certain hydrogenated or saturated block copolymers having at least three blocks are highly effective viscosity index improving additives for mineral oils and are especially effective at elevated temperatures.

3,668,126

METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL

Yasuo Tamai, and Satoru Honjo, both of Kanagawa, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan

Filed Jan. 22, 1968, Ser. No. 699,365
Claims priority, application Japan, Jan. 20, 1967, 43/13908
Int. Cl. G03g 9/04
U.S. Cl. 352—62.1 9 Claims

An electrophotographic liquid developer composed of a carrier liquid with a volume resistivity of over $10^9\Omega$cm and specific dielectric constant of below 3.5, colored material in fine powder form, a charge control agent selected from the group consisting of a vinyl chloride polymer and nitrocellulose which is insoluble in said carrier liquid, a material selected from the group consisting of resin, oil and mixtures thereof, having high compatability with said charge control agent and being soluble in said carrier liquid, a liquid which dissolves said charge control agent and is compatible with said carrier liquid, and a dispersion stabilizer accounting for less than 20 percent (by weight) and more than 0.5 percent (by weight) of the whole.

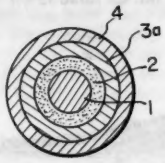
3,668,127

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Hazime Machida, and Zenjiro Okuno, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed June 25, 1969, Ser. No. 836,246
Claims priority, application Japan, July 1, 1968, 43/45135
Int. Cl. G03g 9/04
U.S. Cl. 252—62.1 6 Claims

A liquid developer for use in electrophotography, wherein a toner comprising pigment particles and a resinous layer coated on said pigment particles is dispersed in a carrier liquid of high electric resistance and low dielectric constant, said developer being characterized by the fact that the pigment particles are coated with a resinous layer consisting of at least two layers of which the first layer is directly coated on the particles and is comprised of a resin insoluble in said carrier liquid while the outermost layer comprises a resin capable of somewhat swelling up in said carrier liquid.



3,668,128

ELECTRICAL INSULATING OIL, AND TO ELECTRICAL APPARATUS INCORPORATING THEM

John Kenneth Anderson, Bexley, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed Jan. 2, 1970, Ser. No. 461
Claims priority, application Great Britain, Jan. 9, 1969, 1,298/69
Int. Cl. H01b 3/00
U.S. Cl. 252—63 17 Claims

An insulating oil which has good resistance to oxidation and which is also non-gassing and of low viscosity comprises from 1–50 percent (by weight) of a residually unsaturated alkene polymer, and correspondingly from 99–50 percent of a low viscosity hydrocarbon oil. The polymer is derived predominantly from an alkene or alkenes having from three to five carbon atoms and has an average molecular weight in the range 100–900, preferably in the range 250–500. A mixture of such alkene polymers may be used. The hydrocarbon oil is preferably a mineral oil, and has a viscosity of 30 centistokes or less at 20° C.

3,668,129

DRILLING FLUID COMPOSITION AND ADDITIVE THEREFOR

Robert P. Willett, 5948 North Market Street, Shreveport, La.

Filed June 3, 1970, Ser. No. 43,201
Int. Cl. C10m 3/26
U.S. Cl. 252—8.5 P 13 Claims

An aqueous drilling fluid contains a drilling fluid additive which comprises a mixture of a hydrocarbon oil containing an emulsifying agent in amounts sufficient to produce a stable emulsion of the oil in water and an ethylene oxide adduct of an ester of a polyalkanolamine and a high molecular weight polybasic fatty acid. The adduct contains sufficient ethylene oxide units to render the adduct water soluble. Optionally, the additive contains a water-soluble surfactant.

3,668,130

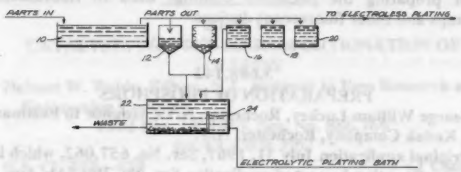
CHROMIC ACID CONDITIONER FOR TREATMENT OF POLYMERIC RESIN SURFACES FOR ELECTROLESS PLATING

Leon A. Kadison, Pasadena, and Eileen Maguire, San Gabriel, both of Calif., assignors to Crown City Plating Co., El Monte, Calif.

Filed Oct. 31, 1969, Ser. No. 872,880
Int. Cl. H05k 1/00; B44d 5/04
U.S. Cl. 252—79.2 11 Claims

Aqueous chromic acid solutions containing from 1.1 to 1.3 kilograms of chromium trioxide per liter of solution as pro-

vided by the presence of trivalent chromium are used to condition polymeric resin surfaces for electroless plating.



3,668,131

DISSOLUTION OF METAL WITH ACIDIFIED HYDROGEN PEROXIDE SOLUTIONS

Russell S. Banush, Trenton, Mich., and Donald P. Hagerty, Somerville, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 9, 1968, Ser. No. 751,388. The portion of the term of the patent subsequent to Oct. 25, 1985, has been disclaimed.

Int. Cl. C09k *3/00*; C23f *1/04*

U.S. Cl. 252—79.4 21 Claims

Invention relates to the treatment of metal with hydrogen peroxide, and particularly to urea and thiourea catalyzed acid-hydrogen peroxide solutions as etchants for copper in the manufacture of printed circuits.

3,668,132

COMPOSITION AND METHOD

Earl E. Finder, Cottage Grove, Minn., assignor to Ecodyne Corporation, Chicago, Ill.

Filed June 15, 1970, Ser. No. 46,551

Int. Cl. C02b *5/04*

U.S. Cl. 252—80 8 Claims

An improved water treating composition comprising about 45 to 85 percent alkali metal hexametaphosphate, about 5 to 35 percent alkali metal pyrophosphate, and about 3 to 30 percent di-alkali metal orthophosphate. The preferred composition is a 70-20-10 composition, containing 70 percent sodium hexametaphosphate, about 20 percent sodium hydrogen pyrophosphate, and about 10 percent dipotassium orthophosphate. The invention also provides a method for treating water which comprises adding the foregoing compositions to water at levels of about 0.5 to 20 ppm.

3,668,133

DETERGENT OILY AGENT ADAPTED TO BE WELL ADSORBED IN FABRICS AND HAVING DETERGENCY

Yoshinobu Ijiri, Hiroshima; Yoshiaki Yano, Osaka, and Hiroshi Yoshida, Hiroshima, all of Japan, assignors to Hiroshima Kago Kabushiki Kaisha Minamikanon, Hiroshima-shi, Hiroshima-ken, Japan

Filed June 30, 1970, Ser. No. 51,377

Claims priority, application Japan, June 30, 1969, 44/51934

Int. Cl. C09k *3/22*

U.S. Cl. 252—88 2 Claims

A detergent oily agent for the treatment of cotton and other fabrics for utilization typically as mops, said agent consisting essentially of a mineral oil. This mineral oil is added with a first nonionic surface-active agent, a cationic surface-active agent and a second nonionic surface-active agent. The second nonionic surface-active agent, such as polyoxyethylene alkyl phenol ether, is designed to serve as an emulsifier of the mineral oil and the other surface-active agents in a neutral solution, e.g., water. The mineral oil so emulsified can be effectively and surely absorbed in fabrics and has an effective detergency.

3,668,134

DETERGENT COMPOSITIONS CONTAINING THE ETHERS AND ESTERS OF TETRAHYDROFURAN AND TETRAHYDROPYRAN

Vincent Lamberti, Upper Saddle River, and Ronald R. Winegrad, Bloomfield, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of application Ser. No. 763,374, Sept. 27, 1968, now abandoned. This application Apr. 20, 1970, Ser. No. 30,245

Int. Cl. C11d *1/00*

U.S. Cl. 252—89 11 Claims

Detergent compositions containing an organic detergent and, as a perfumery ingredient, an ester or ether of tetrahydrofuran or tetrahydropyran.

3,668,135

ANTIMICROBIC WASHING AGENTS, WASHING ADJUVANTS AND CLEANING AGENTS

Heinz Gunter Nosler, Monheim Rhine-Land; Richard Wessendorf, Hilden Rhine-Land, and Horst Bellinger, Dusseldorf, all of Germany, assignors to Henkel & Cie., GmbH, Dusseldorf, Germany

Continuation-in-part of application Ser. No. 747,453, July 25, 1968, now Patent No. 3,592,928. This application Nov. 7, 1968, Ser. No. 774,183

Claims priority, application Germany, June 4, 1968, P 17 67 684.5; July 25, 1967, P 16 68 195.1

Int. Cl. C11d *3/48*

U.S. Cl. 252—107 20 Claims

Antimicrobic washing agents and adjuvants and cleaning compositions comprising (a) 0.2 to 30 percent by weight of a nitroalkyl-N-phenylcarbamate selected from the group consisting of 2-nitropropyl-N-phenylcarbamate, 1-methyl-2-nitropropyl-N-phenylcarbamate, 2-nitrobutyl-N-phenylcarbamate, 2-bromo-2-nitroethyl-N- (3-chlorophenyl)-carbamate, 2-bromo-4-nitrobutyl-N-(4-nitrophenyl)-carbamate, 2-bromo-2-nitrobutyl-N-(3, 4-dichlorophenyl)- carbamate, 2-bromo-2-nitropropyl-N-phenyl-carbamate and 2-bromo-2-nitrobutyl-N-(4-fluorophenyl)-carbamate (b) at least 5 percent by weight of an alkaline builder having calcium carbonate binding capacity in the Hampshire test of not more than 230 mg per gm of builder and (c) and optionally other common components of washing agents, washing adjuvants or cleaning compositions.

3,668,136

COMPATIBLE ANIONIC-CATONIC SURFACTANT COMPOSITIONS

Graham Barker, Fair Lawn, N.J., assignor to Witco Chemical Corporation, New York, N.Y.

Filed July 7, 1969, Ser. No. 839,698

Int. Cl. C11d *9/46*, *1/65*

U.S. Cl. 252—117 20 Claims

Novel surfactant compositions comprising an anionic surfactant and certain cationic surfactants compatible with same and in the form of quaternary ammonium compounds containing polyoxypropylene groups, said compositions exhibiting imprsved foam and solubilizing characteristics.

3,668,137

COMPOSITION AND METHOD FOR INHIBITING ACID ATTACK OF METALS

George Gardner, Elkins Park, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Apr. 1, 1969, Ser. No. 812,368

Int. Cl. C11d *7/34*

U.S. Cl. 252—149 30 Claims

A composition comprising a nitrogenous organic compound, a carboxylic acid and a sulfonium salt for use in an acidic aqueous composition for the purpose of inhibiting acid attack on metallic surfaces which are contacted with the acidic composition.

ERRATUM

For Class 252—180 see:
Patent No. 3,668,094

3,668,138

METHOD OF INHIBITING CORROSION WITH AMINO DIPHOSPHONATES

Merwin Frederick Hoover, Pittsburgh; Gloria Di Marco Sinkovitz, Bridgeville, and Andrew Martin Ruland, Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1970, Ser. No. 93,419

Int. Cl. C02b *5/06;* **C23f** *11/16, 14/07*

U.S. Cl. 252—181 **8 Claims**

Amino diphosphonic acid compounds and water-soluble salts thereof alone and in combination with zinc are disclosed as inhibiting the corrosion of metals in contact with water.

3,668,139

CATALYST AND METHOD OF POLYESTER POLYMERIZATION

David A. Daniels, Kendall Park, N.J.; Rowland L. Orem, Jr., Baltimore, and Edwin E. Lard, Bowie, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Original application Dec. 10, 1968, Ser. No. 782,734, now Patent No. 3,575,918. Divided and this application May 28, 1970, Ser. No. 50,011

Int. Cl. C08g *51/74;* **C07c** *73/00*

U.S. Cl. 252—186 **2 Claims**

A catalyst, containing a ketone peroxide, e.g., methyl ethyl ketone peroxide, and an organic non-ketonic diperoxide, e.g., 2,5-dimethyl-2,5-bis(2-ethyl hexanoyl peroxy)hexane, is used to cure polyester resins containing over 900 p.p.m. of an inhibitor. A small amount of sodium methoxide can be used as part of the catalyst. More specifically, polyester resins containing 900 to 40,000 p.p.m. of inhibitors can be cured within 10 minutes to 24 hours with the novel catalyst.

3,668,140

PROCESS FOR RECLAIMING YTTRIUM ORTHOVANADATE PHOSPHORS

Costas C. Lagos; Richard A. Fowler, both of Danvers, and Martha J. B. Thomas, Winchester, all of Mass., assignors to Sylvania Electric Products Inc.

Filed June 30, 1970, Ser. No. 51,372

Int. Cl. C09k *1/44*

U.S. Cl. 252—301.4 R **1 Claim**

Europium activated yttrium orthovanadate phosphors are reclaimed and treated to eliminate unwanted ionic species. The phosphor is heated in a reducing atmosphere to reduce the vanadate and then dissolved in a mineral acid to form a clear solution. After the solvent is volatilized, the phosphor is heated in an oxidizing atmosphere.

3,668,141

PROCESS FOR PRECIPITATING LUMINESCENT ALKALINE EARTH HALOAPATITES

Roger D. Piper, Des Peres, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed Apr. 28, 1969, Ser. No. 822,099

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.4 P **16 Claims**

In the precipitation of luminescent alkaline earth haloapatites, control of particle size distribution and crystal form is improved by concurrently adding a first solution containing the alkaline earth ions and a second solution containing a major portion of the phosphate ions to a stirred aqueous precipitation medium, which initially contains a minor portion of the required phosphate ions. Also, the solutions are added to the precipitation medium in such a manner that the alkaline earth ions are dispersed into the main body of the precipitation medium relatively more slowly than the phosphate ions. Under preferred conditions, the haloapatites are thereby precipitated in the form of novel compact botryoidal agglomerates whose particle size and low tricalcium phosphate content makes them useful and advantageous for preparing the phosphor coatings used in fluorescent lamps and other fluorescent devices.

3,668,142

PREPARATION OF PHOSPHORS

George William Luckey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original application July 31, 1967, Ser. No. 657,062, which is a continuation-in-part of application Ser. No. 390,741, Aug. 19, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 346,395, Feb. 21, 1964, now abandoned. Divided and this application Nov. 16, 1970, Ser. No. 90,031

Int. Cl. C09k *1/04*

U.S. Cl. 252—301.5 **77 Claims**

Inorganic phosphors are prepared by separately introducing the anions and cations to form the phosphor into a reaction solution; maintaining in the reaction solution, throughout the reaction, an excess of up to 1 molar of the anion or cation; preventing local excesses of anions and cations; and, growing crystals of the phosphor to at least 0.5 micron.

3,668,143

PREPARATION OF PHOSPHORS BY PRECIPITATION FROM SOLUTION

George W. Luckey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 390,741, Aug. 19, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 346,395, Feb. 21, 1964, now abandoned. This application July 31, 1967, Ser. No. 657,062

Int. Cl. C09k *1/04*

U.S. Cl. 252—301.4 R **77 Claims**

Inorganic phosphors are prepared by separately introducing the anions and cations to form the phosphor into a reaction solution; maintaining in the reaction solution, throughout the reaction, an excess of up to 1 molar of the anion or cation; preventing local excesses of anions and cations; and, growing crystals of the phosphor to at least 0.5 micron.

3,668,144

DUST-FREE LEAD STABILIZER FOR SYNTHETIC RESINS

Derek Gordon Pearson, Denham, England, assignor to Associated Lead Manufacturing Limited, London, England

Filed Mar. 6, 1970, Ser. No. 17,294

Claims priority, application Great Britain, Mar. 10, 1969, 12,496/69

Int. Cl. B01j *1/16;* **C08f** *45/58;* **C08g** *51/58*

U.S. Cl. 252—400 **10 Claims**

A dust-free lead stabilizer mix which consists of a basic lead salt of an inorganic acid enveloped in an organic liquid which has been gelled by the addition to it of a lubricating stabilizer.

3,668,145

PRODUCTION ACTIVATED CARBON IN DUAL PULSE JET ENGINE SYSTEM

John W. Belter, Grand Forks, N. Dak.; Leroy Dockter, Laramie, Wyo., and Robert C. Ellman, East Grand Forks, Minn., assignors to The United States of America as represented by the Secretary of the Interior

Filed Nov. 9, 1970, Ser. No. 87,759

Int. Cl. C01b *31/08*

U.S. Cl. 252—421 **8 Claims**

A particulate carbonaceous feedstock such as lignite is entrained and activated in the oscillating combustion gas in the two opposed tail pipes of the dual pulse-jet engine system.

Gas continually withdrawn from the juncture of the two pipes contains entrained activated carbon which is subsequently separated from the gas.

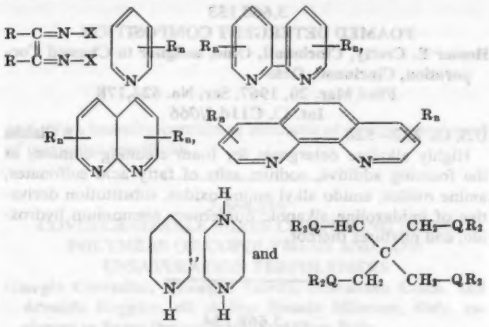
3,668,146

CATALYSTS FOR THE DISPROPORTIONATION OF OLEFINS

Helmut W. Ruhle, Edison, N.J., assignor to Esso Research and Engineering Company

Filed Dec. 19, 1969, Ser. No. 886,766
Int. Cl. C07c 3/62
U.S. Cl. 252—428 11 Claims

The instant invention relates to a novel process for preparing catalysts which are useful in the disproportionation of olefins. In more detail the instant process comprises contacting within a solvent, a metallic complex having the formula $L_aM_b(CO)$ wherein L is selected from the group consisting of CO, R_3Q, R_3QO, $(RO)_3Q$, RNH_2, R_2NH, RCN, R_2SO, $R_3N{-}CN$, $R_3P{=}N{-}CN$, $R_3P{=}NH$, $R_3P{=}CH{-}CH_3$, $R_3Q{-}QR'_2$, $R_2Q{-}R^2{-}QR'_2$, $R_2Q{-}R^2{-}QR{-}R^2{-}QR'_2$, $R{-}Z{-}R^2{-}Z{-}R$, $R{-}Z{-}R^2{-}Z{-}R^2{-}Z{-}R$



and

wherein Q is selected from the group consisting of N, P, As and Sb; Z is selected from the group consisting of O and S; X is selected from the group consisting of NR_2, OH, OR and R; R is selected from the group consisting of C_1 to C_{20} hydrocarbyl and hydrogen radicals; and R^2 is selected from the group consisting of divalent C_1 to C_{20} hydrocarbyl radicals; *n* is an integer of from 0 to 2; M is a Group VI-B metal selected from the group consisting of Cr, Mo and W; *a* may vary from 1 to 4; *b* may vary from 1 to 2; and *c* may vary from 2 to 10, with an ionic compound, said ionic compound being selected from the group consisting of compounds having the general formula $R'_4Q'X'$, R'_3ZX', $(R'_4Q')(A1R'_dX'_{4-d})$, $(R'_3Z)(A1R'_dX'_{4-d})$, mixtures of $R'_4Q'X'$ or R'_3ZX' with $A1R'_dX'_{3-d}$ or mixtures thereof wherein R′ is selected from the group consisting of C_1 to C_{20} hydrocarbyl radicals and halogenated derivatives thereof, Q′ is selected from the group consisting of nitrogen, phosphorous or arsenic, Z is selected from the group consisting of oxygen or sulfur, X′ is halogen and *d* may vary from 0 to 3, and said ionic compound being at least partially soluble in said solvent and an activator, said activator comprising an organometallic derivative selected from the group consisting of compounds having the general formulas $R''_gA1X'_{(3-g)}$, a mixture of the above compound with a compound having the general formula $A1X'_3$, a compound of the general formula $R''_eM'X'_g$, a mixture of one of several compounds having a formula $R''_eM'X'_g$ with one of the various compounds having the formula $R''_eA1X'_{(3-g)}$ and $A1X'_3$ wherein R″ is selected from the group consisting of C_1—C_{20} hydrocarbyl radicals and the alkoxy and halo derivatives thereof, M′ is a metal selected from Groups I through III of the Periodic Table of Elements, X′ is halogen, *e* is equal to 1 or 2, *f* is an integer between 1 and 3, and *g* is 0, 1 or 2, the atomic ratios of the metal in said activator to the metal in said metallic complex being from about 20:1 to 1:1, the molar ratio of Cr, Mo, or W of said metallic complex to ionic compound being from about 10:1 to 0.1:1, and the molar ratio of said Group I–III metal of said activator to ionic compound being from about 40:1 to 1.5:1.

3,668,147

MULTIPLE PROMOTED IRON OXIDE-ANTIMONY OXIDE CATALYSTS FOR OXIDATION OF OLEFINS

Takachika Yoshino, Yokohama; Shigeru Saito, Fuchu-shi; Jun Ishikura; Yutaka Sasaki, both of Yokohama, and Masukuni Sobukawa, Tokyo, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1968, Ser. No. 777,104
Claims priority, application Japan, Nov. 28, 1967, 42/75890; Sept. 20, 1968, 43/67578; 43/67580; 43/67579
Int. Cl. B01j 11/82
U.S. Cl. 252—432 3 Claims

This invention provides a multiple promoted iron oxide-antimony oxide catalyst composition having the empirical formula:

$$Fe_{10}Sb_{5-60}Me_{0.01-1}Te_{0.05-5}X_{0-1}O_{22-151}$$

wherein Me is V, Mo or W, and X is P or B.

The catalyst composition of this invention exhibits an improved catalytic activity in an oxidation reaction selected from the group consisting of ammoxidation of olefins to nitriles, oxidation of olefins to aldehydes, and oxidative dehydrogenation of olefins (C_4—C_8) to diolefins, particularly, in the case where high conversion is achieved and the amount of residual oxygen is very small.

For example, the catalysts of this invention [Ex. 1 and Ex. 12] and the catalysts of the prior art [R-1 and R-6] are prepared in the same manner, the compositions of these catalysts being as follows:

Ex. 1 : $Fe_{10}Sb_{25}W_{0.25}Te_{0.5-1}O_{67-68} \cdot (SiO_2)_{30}$
Ex. 12 : $Fe_{10}Sb_{25}E_{0.1}Te_{0.2-1}O_{66-68} \cdot (SiO_2)_{30}$
R—1 : $Fe_{10}Sb_{25}O_{65} \cdot (SiO_2)_{30}$
R—6 : $Fe_{10}Sb_{25}W_{1.5}O_{70} \cdot (SiO_2)_{30}$

Note: By "$(SiO_2)_{30}$" is meant silica carrier.

The activities of these catalysts are tested by the same method. The following maximum conversions (%) of olefins to acrylonitrile (AN), methacrylonitrile (MAN), acrolein (AL), methacrolein (MAL) and butadiene (BDE) are obtained:

	AN	MAN	AL	MAL	BDE
Ex. 1	78	70	70	58	82
Ex. 12	77	69	69	55	82
R—1	65	53	33	26	73
R—6	—	49	43	33	70

3,668,148

CATALYST PREPARED BY HOMOGENEOUS PRECIPITATION UNDER HIGH TEMPERATURE AND PRESSURE

Wilhelmus Petrus Van Beek, and Theo Jan Osinga, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 26,051
Claims priority, application Luxembourg, Apr. 9, 1969, 58391
Int. Cl. B01j 11/82, 11/06
U.S. Cl. 252—440 5 Claims

A process for preparing a catalyst comprising a metallic catalytic agent on a particulate carrier is disclosed which provides improved uniformity of distribution and fineness of division with narrowness of particle size distribution of the metallic catalytic agent on the carrier. The particles of carrier are suspended by agitation in an aqueous solution of a salt

of the metallic catalytic agent and of a source, on heating in aqueous solution, of hydroxyl ions. The suspension is heated in a sealed vessel above 100° C to precipitate the metal or the particles with uniformity of distribution and fineness of division with narrowness of particle size distribution. The metal is converted by conventional procedures to the appropriate active, oxidized or reduced, state. The process is particularly significant with carriers, such as alumina and silica, that in alkaline media are liable to undergo structural charges.

3,668,149

METHOD AND EQUIPMENT FOR THE PREPARATION OF CATALYTICALLY ACTIVE BODIES

John W. Geus, Geleen, and Jan C. Lemmens, Beek, Limbug, both of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Oct. 13, 1969, Ser. No. 865,821
Claims priority, application Netherlands, Oct. 11, 1968, 68/4538; Nov. 18, 1968, 68/6394
Int. Cl. B01j *11/44*
U.S. Cl. 252—448 3 Claims

Porous catalyst bodies are produced from a thermally stable inorganic carrier material by introducing a suspension of the said carrier material into a liquid immiscible with the suspension medium and heated above the boiling point of the said medium. After evaporation of the suspension medium to an essential extent, the porous catalyst bodies formed are separated from the liquid and subsequently heated to an elevated temperature to improve the strength caracteristics thereof.

3,668,150

CONCRETE FLOOR WITH GROUND METAL AGGREGATE AT THE WEAR SURFACE

Howard J. Horvitz, 21800 Shaker Blvd., Shaker Heights, Ohio

Filed Nov. 16, 1970, Ser. No. 90,040
Int. Cl. C04b *7/02*; H01b *1/02*
U.S. Cl. 106—90 10 Claims

A dry mix for making concrete comprising approximately 28 to 38 percent cement, approximately 62 to 72 percent powdered ferrous metal and approximately 0.01 to 0.80 percent sodium nitrite.

A method of making a substrate which includes forming a base of a conventional concrete mix and screeding and floating the base to form a substantially flat surface. The base is allowed to set until the bleed water disappears and then a dry mixture of approximately 28 to 38 percent cement, approximately 62 to 72 ground ferrous metal and approximately 0.01 to 0.80 percent sodium nitrite is deposited in a uniform manner on the flat surface by shaking. After the dry mixture absorbs adequate water from the base, it is floated and trowelled to the desired finish.

3,668,151

HIGH STRENGTH CATALYST PELLETS

Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed May 28, 1969, Ser. No. 828,772
Int. Cl. B01j *11/22*
U.S. Cl. 252—466 4 Claims

A method of preparing a high strength catalyst pellet is disclosed which comprises calcining particulate ZnO admixed with particulate Al_2O_3. Additionally, a catalytic process using a prepared high strength catalyst is disclosed.

3,668,152

PORCELAIN ENAMELS FOR SELF-CLEANING COOKING OVEN

William S. Lee, Bay Village, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Original application Mar. 22, 1968, Ser. No. 715,186, now Patent No. 3,598,650. Divided and this application May 13, 1969, Ser. No. 847,753
Int. Cl. B01j *11/00*
U.S. Cl. 252—477 4 Claims

A porcelain enamel frit containing a high level of an oxidation inducing metal oxide, preferably cobalt, adaptable to be incorporated into a vitreous porcelain enamel for application to an oven liner, said enamel characterized by the ability to completely oxidize oven soils when heated to a point above 350° F., but below 600° F., and method of utilizing same as a self-cleaning oven liner coating.

3,668,153

FOAMED DETERGENT COMPOSITION

Homer E. Crotty, Cincinnati, Ohio, assignor to Chemed Corporation, Cincinnati, Ohio

Filed Mar. 20, 1967, Ser. No. 624,178
Int. Cl. C11d *3/066*
U.S. Cl. 252—528 8 Claims

Highly alkaline detergents for foam cleaning contain, as the foaming additive, sodium salts of fatty acid sulfonates, amine oxides, amido alkyl amine oxides, substitution derivative of imidazoline alkanoic quaternary ammonium hydroxide, and mixtures thereof.

3,668,154

PHOSPHORUS-CONTAINING POLYOLS AND POLYURETHANES EMBODYING SAME

Michel A. Buisson, Lavera, France, assignor to Naphtachimie, Paris, France

Filed June 3, 1970, Ser. No. 43,218
Claims priority, application France, June 4, 1969, 6918298
Int. Cl. C08g *22/14*, *22/46*
U.S. Cl. 260—2.5 AR 16 Claims

This invention is addressed to phosphorus-containing polyols prepared by reacting a chloro-chloro-alkyl phosphate having an average of 0.5 to 2.5 chlorine atoms joined directly to a phosphorus atom with a primary or secondary amine having at least one function which is capable of reacting with an organic isocyanate in the presence of water and a hydrogen chloride acceptor whose reaction product with HCl is soluble in water, and to flame or fire resistant polyurethanes prepared by reaction of a phosphorus-containing polyol and an organic polyisocyanate.

3,668,155

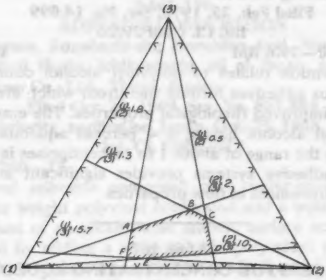
SELF-EXTINGUISHING ETHYLENE COPOLYMER FOAMS COMPRISING A TERNARY MIXTURE OF AN ANTIMONY COMPOUND, A HALOGEN-CONTAINING COMPOUND AND A BROMINE COMPOUND

Charles Raley, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 606,579, Jan. 3, 1967, now abandoned. This application June 27, 1968, Ser. No. 740,675
Int. Cl. C08f *15/02*; C09k *3/28*
U.S. Cl. 260—2.5 FP 11 Claims

Compositions of the class of flame-retardant or self-extinguishing ethylene and vinyl alkanoate copolymer foams, useful as insulation, are described. Said foams are relatively lightly loaded with either a binary flame retardant mixture of (1) an antimony compound and (2) a halogen-containing

aliphatic or cycloaliphatic compound of particular specificity or a ternary flame-retardant mixture including (1) and (2),



and, (3) a bromine-containing aromatic or acyclic compound of particular specificity.

3,668,156

COVULCANIZABLE MIXES COMPRISING DIENE POLYMERS OR COPOLYMERS AND LOW UNSATURATION TERPOLYMERS

Giorgio Corradini; Giuseppe Ghetti; Sebastiano Cesca, and Arnaldo Roggero, all of San Donato Milanese, Italy, assignors to Snam Progettic S.p.A., Milan, Italy

Filed Apr. 23, 1970, Ser. No. 31,411
Claims priority, application Italy, Apr. 23, 1969, 15874 A/69
Int. Cl. C08f *17/00*
U.S. Cl. 260—5 **4 Claims**

A terpolymer-diene composition that is readily curable with conventional vulcanizing agents is provided by preparing a mixture of diene polymer or copolymer with an olefinic terpolymer which includes at least one

group directly bound to two carbon atoms, each of which is characterized by ethylenic unsaturation, wherein R_1 is a hydrocarbon radical.

3,668,157

BLEND CONTAINING AT LEAST A CELLULOSE ESTER AND A BLOCK COPOLYMER ELASTOMER

Robert L. Combs, and Richard T. Bogan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 23, 1970, Ser. No. 57,775
Int. Cl. C08b *21/08*; C08g *39/10*, *41/04*
U.S. Cl. 260—13 **13 Claims**

Cellulose ester compositions useful for producing optically clear extruded sheets, or molded or vacuum-formed products having high impact strength and toughness, said compositions being composed of (I) a cellulose ester, (II) a block copolymer elastomer which contains polyester or polyurethane segments. Such compositions may optionally contain a polyalkylacrylate or polyalkylacrylate-methacrylic acid polymer and/or a plasticizer for the cellulose ester component.

3,668,158

COMPOSITION FOR ADHERING PLASTIC FILM TO A VAPOR PENETRABLE NON-METALLIC SUBSTRATE

Robert James Keithley, Bellston Lake, N.Y., assignor to Borden Inc., New York, N.Y.

Filed June 3, 1970, Ser. No. 43,243The portion of the term of the patent subsequent to Aug. 18, 1987, has been disclaimed.
Int. Cl. C08b *21/32*, *21/34*
U.S. Cl. 260—17 R **11 Claims**

This invention relates to an adhesive composition for applying a plastic film of a vapor penetrable backing or core material comprising an aqueous emulsion of an aliphatic 1-olefin and a vinyl ester of a lower monocarboxylic acid, the proportions of olefin in the copolymer being from 5–25 parts by weight the proportion of vinyl ester being the necessary remainder to make 100 parts total weight of copolymer and a water dispersible non-separating combination of (1) a wate soluble ester of a mono- C_1–C_4 alkyl ether of a C_2–C_4 glycol with a C_2–C_4 saturated monocarboxylic aliphatic acid and (2 a plasticizing ester of glycerin with saturated C_2–C_4 monocarboxylic aliphatic acid, the ester of the said ether and the plasticizing ester being dispersed in substantially non-separating condition in the aqueous phase of the emulsion.

3,668,159

IN SITU PROCESS FOR TRANS-ISOMERIZATION AND CONJUGATION OF RESINS CONTAINING FATTY ACID ESTERS

Lowell O. Cummings, San Anselmo, Calif., assignor to Pacific Vegetable Oil Corporation, San Francisco, Calif.

Filed Dec. 23, 1970, Ser. No. 101,057
Int. Cl. C08g *17/16*
U.S. Cl. 260—18 EP **15 Claims**

A method is provided for producing resins or esters from starting esterifiable components and polyunsaturated, non-conjugated fatty acids whereby the mass is heated in intimate admixture with sulfur dioxide gas to effect conjugation in situ and also rearrangement to provide increased isolated trans double bonds. The esterifiable components are suitably epoxy resins or alkyd-forming mixtures.

3,668,160

RESIN-COATED SAND MIXES FOR SHELL MOLDING

Robert A. Horton, Chesterland, and Timothy L. Coghill, Mentor, both of Ohio, assignors to Precision Metalsmiths, Inc.

Filed Apr. 21, 1969, Ser. No. 818,118
Int. Cl. B22c *1/22*; C08g *5/20*, *51/72*
U.S. Cl. 260—19 R **8 Claims**

For use in resin-shell molding, a resin-coated sand mix containing a small percentage of a non-volatile, oily, organic liquid suitable to alleviate the condition of peel-back.

3,668,161

DEVOLATILIZATION OF LIQUID POLYMER COMPOSITIONS

Edward B. Nauman; Ted T. Szabo, both of Martinsville, N.J.; Felix P. Klosek, South Charleston, W. Va., and Stephen Kaufman, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 9, 1969, Ser. No. 831,353
Int. Cl. C08f *47/10* ; B01d *11/0* *4*
U.S. Cl. 260—2.5 E **5 Claims**

A method is provided for separating volatiles from a liquid composition containing polymer and volatile constituents when composition is passed thru a flash first devolatilization zone maintained at reduced pressure to vaporize and remove volatile constituents and produce a partially devolatilized composition, said partially devolatilized composition is heated and dispersed with foaming agent, and is passed thru a second flash devolatilization zone maintained at reduced pressure to vaporize and remove remaining volatile constituents and produce a finally devolatilized composition.

3,668,162

TREATING POLYBUTADIENE

Mason S. Wilt, Borger, Tex., assignor to Phillips Petroleum Company

Filed Nov. 25, 1968, Ser. No. 778,855
Int. Cl. C08d 9/12
U.S. Cl. 260—27 14 Claims

Polybutadienes are treated with titanium tetrachloride and molecular oxygen to form modified polybutadiene products having substantially higher Mooney viscosities, characterized by a reduced tendency to cold flow.

3,668,163

EMULSIONS OF WATER IN HALOGENATED SOLVENTS WHICH CONTAIN FLUORINATED OIL AND WATER REPELLENTS

Theodore Clyde Rapp, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 5, 1969, Ser. No. 847,737
Int. Cl. C08f 45/52, 45/30; D06m 11/00
U.S. Cl. 260—28.5 D 10 Claims

A water-in-oil emulsion comprising a chlorinated alkane solvent having contained therein in emulsified form an aqueous dispersion of a fluorinated oil- and water-repellent polymeric composition, wax, a melamine derivative, and a mixture of selected sulfonates.

3,668,164

AQUEOUS RESOLE RESIN COMPOSITION CONTAINING A POLYAMINOALKYL-SUBSTITUTED ORGANOSILOXANE COPOLYMER

John R. Le Blanc, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 647,622, June 21, 1967, now abandoned. This application Mar. 4, 1970, Ser. No. 16,619
Int. Cl. C08g 47/0 4
U.S. Cl. 260—29.3 1 Claim

This application describes a stable, aqueous catalyst system adapted to be admixed with an aqueous resole resin and thereafter to accelerate resin cure when the product mixed resin system is dried and thermoset. The catalyst is especially useful when using phenolic resins for treating paper employed in the manufacture of water-repellent resin treated paper.

3,668,165

DISPERSION POLYMERIZED TERPOLYMER OF VINYL ACETATE, VINYL ESTER OF A FATTY ACID, AND VINYL CHLORIDE

Eduard Bergmeister; Joseph Heckmaier; Paul-Gerhard Kirst, and Hubert West, all of Burghausen/Upper Bavaria, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Continuation of application Ser. No. 727,692, May 8, 1968. This application Sept. 11, 1970, Ser. No. 71,362
Claims priority, application Germany, May 10, 1967, W43960
Int. Cl. C08f 15/40
U.S. Cl. 260—29.6 T 5 Claims

This invention relates to a process for the preparation of an aqueous polymerizate dispersion which comprises the steps of subjecting 100 parts by weight of a monomer mixture consisting of: (a) 40 to 70 parts by weight of vinyl acetate, (b) 15 to 30 parts by weight of a vinyl ester of fatty acids having eight to 18 carbon atoms and (c) 15 to 30 parts by weight of vinylchloride to an aqueous dispersion polymerization in the presence of (1) free-radical forming catalysts, (2) at least one protective colloid and (3) an emulsifier selected from the group consisting of anionic emulsifiers, non-ionic emulsifiers and mixtures thereof, and recovering said aqueous polymerizate dispersion, as well as the aqueous polymerizate dispersions so produced.

3,668,166

POLYVINYL ALCOHOL ADHESIVES

Thomas G. Kane, and William D. Robinson, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1970, Ser. No. 14,099
Int. Cl. C08f 29/26
U.S. Cl. 260—29.6 BM 14 Claims

The invention relates to polyvinyl alcohol compositions and aqueous adhesives formed therefrom which are characterized by improved rheological properties. The employment of polyvinyl alcohol having a 4 percent aqueous solution viscosity in the range of about 1 to 16 centipoises in aqueous tackified adhesive systems provides significant and unexpected improvement in flow properties.

3,668,167

PROCESS FOR CONCENTRATING AQUEOUS EMULSIONS OF FLUORINATED POLYMERS

Mario Ragazzini, Milan; Alberto Caimi, Legnano; Donato Carcano, and Giovanni Groppelli, both of Milan, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation-in-part of application Ser. No. 635,400, May 2, 1967, now abandoned. This application Dec. 1, 1969, Ser. No. 881,339
Claims priority, application Italy, May 4, 1966, 17486/66
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 F 1 Claim

A process for the concentration of aqueous polytetrafluoroethylene emulsions comprising forming atop the emulsion to be concentrated a layer of water absorbing agent, maintaining the resultant two layers in contact with each other until absorption of water from the emulsion by the said water absorbing agent has proceeded to a desired degree, separating the said layers, and thence recovering the aqueous polytetrafluoroethylene emulsion thus concentrated. The water absorbing agent can be any one of a number of water soluble organic liquid or solid water absorbing agents having a density less than that of the emulsions to be concentrated.

3,668,168

MOLDABLE METAL POWDER COMPOSITIONS CONTAINING AN ELASTOMER AND SILICA AQUASOLS

James M. Self, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 18,345, Mar. 10, 1970, which is a continuation-in-part of application Ser. No. 739,627, June 25, 1968, now abandoned. This application Aug. 7, 1970, Ser. No. 62,144
Int. Cl. C08d 7/06, 7/14
U.S. Cl. 260—29.7 R 7 Claims

Compositions of metal powder aggregate or metal powder aggregate/refractory mixtures, a siliceous binder, and an elastomeric material useful in the manufacture of metallic shapes or as a metallic filler compound.

3,668,169

PROCESS FOR PIGMENTING LINEAR SATURATED POLYESTERS

George H. Brinkman, Jr., Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 709,681, Mar. 4, 1968, now abandoned. This application July 24, 1970, Ser. No. 58,193
Int. Cl. C08g 51/40, 51/02
U.S. Cl. 260—31.8 XA 8 Claims

A pigment can be uniformly distributed throughout a linear saturated polyester without substantial degradation of the polyester by combining about 100 parts by weight of the polyester with about 0.1–4 parts by weight of a slurry containing about 2–50 percent by weight of the pigment and about 50–98 percent by weight of a chlorinated biphenyl or

diester of phthalic acid and them mixing the combined polyester and slurry above the melting point of the polyester.

3,668,170

ADHESIVE COMPOSITION

Iwao Maruta, Funabashi-shi; Haruhiko Arai, Narashino-shi, and Shozi Horin, Ichikawa-shi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1969, Ser. No. 867,884
Claims priority, application Japan, Oct. 29, 1968, 43/78754
Int. Cl. C08d *9/12*
U.S. Cl. 260—27 4 Claims

A novel adhesive composed of a water-insoluble high molecular weight polyvinyl compound and a water-solubilizing amount of an alkali metal anionic surface active agent, improved by adding a water-soluble polyvalent metal inorganic salt to replace a portion of the alkali metal ions with a polyvalent metal ion. The adhesive is used to attach materials adapted to be subsequently separated by moistening.

3,668,171

NYLON COMPOSITIONS CONTAINING DIISOCYANATE MOLD RELEASE AGENTS

Willard M. Sims, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Jan. 11, 1971, Ser. No. 105,635
Int. Cl. C08g *51/44*
U.S. Cl. 260—32.4 R 7 Claims

The mold release properties of nylon compositions are significantly improved by incorporating about 0.01 to 5.0 parts per 100 parts of nylon of a hydrocarbon diisocyanate having about 25 to 50 carbon atoms in the hydrocarbon chain.

3,668,172

PIGMENTED POLYESTER COMPOSITIONS

George F. Jones, and John R. Mendel, both of Glens Falls, N.Y., assignors to Hercules Incorporated, Wilmington, Del.

Filed Nov. 25, 1969, Ser. No. 879,924
Int. Cl. C08g *51/44*, *51/50*, *51/02*
U.S. Cl. 260—32.6 R 6 Claims

Uniformly pigmented polyester compositions which can be melt spun into fine denier multifilament fibers are described. The preferred compositions are homogeneous blends of unpigmented polyester and a polyethylene pigment concentrate composed of pigment highly dispersed in a mixture of low molecular weight polyethylene, high molecular weight, medium density polyethylene and a surfactant. The most preferred blends also contain a small amount of a phosphoric acid ester.

3,668,173

NOVEL POLYURETHANE-UREA COMPOSITION

George Sidney Wooster, Hamburg, and Voldemar Kirss, Buffalo, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 10, 1969, Ser. No. 884,003
Int. Cl. C08k *1/44*; C08g *51/44*, *51/34*
U.S. Cl. 260—32.6 N 17 Claims

Production of a novel polyurethane-urea composition by (1) reaction of a hydroxy-terminated polymer with an excess of saturated organic diisocyanate to produce an isocyanate-terminated prepolymer and (2) reaction of said prepolymer and a non-aromatic amine comprising a polyoxyalkylene primary diamine. This novel polymer when dissolved in a volatile lacquer solvent is characterized by a low, substantially constant viscosity. The polymer solution provides on evaporation of solvent a thermoplastic coating of excellent weathering and non-blocking characteristics.

3,668,174

HEAT RESISTANT COATING FOR SOLDER CONNECTIONS

Dale E. Smestad, Coltage Grove, Minn., and Nelson E. Quackenbush, Costa Mesa, Calif., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 27, 1971, Ser. No. 110,251
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 SB 1 Claim

A high temperature resistant coating composition for solder connection including a mixture of room temperature vulcanizing rubber having a viscosity rating of 250 poise and selective insulators including magnesium hydroxide, magnesium carbonate, asbestos, mica, barium sulfate and calcium carbonate for shielding the connection from a heat source of a predetermined intensity for a predetermined time.

3,668,175

CRESYLIC ACID BLENDS OF POLYMERIC AMIDE-IMIDE-ESTER WIRE ENAMELS

Frank A. Sattler, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application May 21, 1968, Ser. No. 730,833, now Patent No. 3,555,113, dated Jan. 12, 1971. Divided and this application Aug. 5, 1970, Ser. No. 61,115
Int. Cl. C08g *51/34*
U.S. Cl. 260—33.4 R 20 Claims

Polymeric amide-imide-ester wire enameling compositions are prepared from (1) a monoanhydride of an aromatic tricarboxylic acid, e.g. trimellitic anhydride, (2) an aromatic primary diamine compound and (3) either polyfunctional acids and polyhydroxy compounds or the polyesters thereof. AT least a portion of the polyol or polyhydroxy compound is a tris (hydroxyalkyl) isocyanurate, e.g. tris (hydroxyethyl) isocyanurate. The polyfunctional acids (3) comprise an acid component selected from the group consisting of trimellitic anhydride, isophthalic acid and esters of isophthalic and terephthalic acid. The polymeric amide-imide-ester may be blended with terephthalate or isophthalate polyesters, polyisocyanates and other materials. One particularly suitable polyisocyanate is prepared from dimethylterephthalate, tris (2-hydroxyethyl) isocyanurate and tolylene diisocyanate. Small amounts of aliphatic amino compounds, aliphatic polyols and other flexibilizing materials may be incorporated into either the polymeric amide-imide-ester or the polyester blended therewith. A variety of block and modified block polymers may be made. Imidization occurs during the preparation of the polymeric amide-imide-ester so that the condensed water is removed before the fluid compositions are applied and cured.

3,668,176

METHOD OF MOLDING UTILIZING THERMOSETTING RESINS AND MAGNETIZED FILLER MATERIAL

Clyde O. Childress, 3641 South Court St., Palo Alto, Calif.

Filed Jan. 15, 1970, Ser. No. 3,115
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 EP 5 Claims

Liquid resins and plastisols can be made to assume and hold desired shapes, or to bridge gaps, not attainable with the present commercially available filled liquid resins or plastic puttys by employing a "filler" material, which has magnetic property.

3,668,177

MOLDING MASSES FOR PRODUCING FIBER REINFORCED PLASTIC ARTICLES, METHODS OF PREPARING SUCH MOLDING MASSES, AND ARTICLES PRODUCED THEREFROM

Cornelis Hendrikus Jozephus Van Herpt, Helmond, Netherlands, assignor to N. V. Koninklijke, Helmond, Netherlands

Continuation of application Ser. No. 723,225, Apr. 22, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 512,141, Dec. 7, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 304,462, Aug. 26, 1963, now abandoned. This application May 18, 1970, Ser. No. 37,456

Claims priority, application Netherlands, Sept. 7, 1962, 283020; Aug. 8, 1963, 282776; Mar. 9, 1965, 6502959

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 EP 2 Claims

A molding mass is obtained by adding to a thermosetting resin, for example, a polyester or epoxy resin, in liquid state, a particulate filler material, such as an asbestos or quartz powder, and bundled together reinforcing fibers of inorganic material, such as, glass fibers, which fibers have a diameter in the range from 0.01 to 0.02 mm and a length to diameter ratio between approximately 100 and 500, with the particle size of the filler material varying between 5 and 50μ in direct proportion to the variation of the length to diameter ratio, and subjecting the molding mass to a continuous mixing and kneading action at a localized region and removing one-fourth to one-seventh of the mass transported to the outlet of this region by means of a conveying ribbon and recycling the removed mass to the localized region, the rest of the transported mass being passed out of the mixing zone, thereby to avoid a substantial temperature rise in the mass while the mixing and kneading is continued until the mass has a density of 1.5 and at least approximately 80 percent of the bundled together fibers are pulled apart into individual fibers dispersed uniformly throughout the mass.

3,668,178

UNSATURATED POLYESTER RESINS ADMIXED WITH CYCLIC ESTER POLYMERS

Lowell R. Comstock, South Charleston, and Percy L. Smith, Dunbar, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 812,383, Apr. 1, 1969, now Patent No. 3,549,586, dated Dec. 22, 1970. This application Aug. 28, 1970, Ser. No. 68,051. The portion of the term of the patent subsequent to Dec. 22, 1987, has been disclaimed.

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R 25 Claims

The disclosure of this application is directed to unsaturated polyester compositions, containing a polymer of a cyclic ester having an average of at least one carboxyl group per molecule, which have particular utility in sheet molding applications to form thermoset articles characterized by excellent impact strength and by excellent surface properties such as excellent smoothness, excellent receptiveness to paints and excellent reproduction of the surface contours of the mold in which they are formed into shaped, thermoset articles.

3,668,179

COLOR STABILIZED POLYOLEFIN RESINS

Daniel J. Di Biasi, S. Plainfield, and Albin J. Zilis, Jackson, both of N.J., assignors to Mobil Oil Corporation

Filed Oct. 9, 1969, Ser. No. 865,174

Int. Cl. C08f *45/10*, *45/58*, *45/60*

U.S. Cl. 260—41 A 9 Claims

The incorporation of certain surface active additives, as exemplified by bis(2-ethylhexyl) sodium sulfosuccinate, inhibits undesired coloration in polybutene-1 and other polyolefin resin compositions containing a color-forming phenolic stabilizing agent (e.g., 2,6-di-tert-butyl-o-cresol) which inhibits oxidative degradation of the resin.

3,668,180

PREPARATION OF ALKOXYORGANOPOLYSILOXANE RESINS

James Leo Brennan, Adrian, and Gerald Paul Ford, Tecumseh, both of Mich., assignors to Stauffer-Wacker Silicone Corporation

Continuation of application Ser. No. 714,900, Mar. 21, 1968, now abandoned. This application Oct. 24, 1969, Ser. No. 869,396

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 R 9 Claims

A water repellent composition comprising alkoxylated and partially hydrolyzed organopolysiloxane resins and a process for preparing the same.

The process for preparing the alkoxyorganopolysiloxane resin comprises mixing an organohalosilane with a hydrocarbon solvent, water and a lower aliphatic alcohol; introducing the reactants into a packed side-arm reactor; maintaining the solution in said reactor at a temperature of from about −10° to 10° C. to alkoxylate and partially hydrolyze said organohalosilane, continuously transferring the alkoxylated and partially hydrolyzed solution from said side-arm reactor into a second reactor containing additional solvent maintained at reflux temperature until said organohalosilane is hydrolyzed to a level of from 40 to 80 percent; neutralizing the solution and recovering the alkoxyorganopolysiloxane resin solution.

3,668,181

PURIFICATION OF POLYCARBONATE RESINS

Bryce C. Oxenrider, Florham Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 719,760, Apr. 8, 1968, now abandoned. This application Mar. 6, 1970, Ser. No. 17,348

Int. Cl. C08g *17/13*

U.S. Cl. 260—47 XA 9 Claims

Crude precipitated polycarbonate resin obtained by the reaction of bisphenol A and phosgene, preferably in an aqueous alkaline emulsion containing a water-insoluble partial solvent for the resin, is purified by extraction with aqueous methanol or dimethoxy ethane or a mixture thereof.

3,668,182

BETA HYDROXYETHOXY PHENYL ISOPROPYLIDENE BENZOIC ACID AND ESTER DERIVATIVES METHOD OF PREPARATION AND POLYMERS OF SAID COMPOUNDS

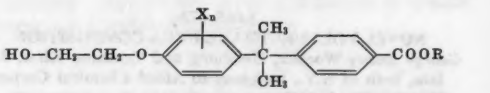
Robert Fuhrmann, Morris Plains; John Pisanchyn, Morristown, and Fred William Koff, Clifton, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 20, 1970, Ser. No. 4,401

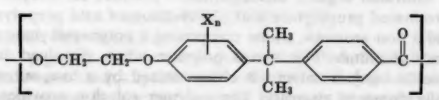
Int. Cl. G08c *17/02*

U.S. Cl. 260—47 C 6 Claims

Polycondensation of monomer of the structure:



wherein R is H or a C_1–C_6 alkyl group, wherein X is an alkyl radical of up to four carbons, chlorine or bromine, and *n* is O—4, affords polymers having recutting units of the structure:



These polymers have good thermal stability and transparency and a high, but not unduly high, glass transition temperature.

3,668,183

PRODUCTION OF POLYENAMINES

Kenneth Look Hoy, St. Albans, W. Va., and Charles Leonard Milligan, Centerville, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,611
Int. Cl. C08g *15/00*
U.S. Cl. 260—65 6 Claims

Polyenamine resins useful as adhesives and in coating applications are produced from the reaction of polyacetoacetates or polyacetoacetamides with blocked polyamines. The blocked polyamines are ketimines or enamines obtained by the reaction of an amine or amide with either a ketone or an aldimine obtained by the reaction of an amine or amide with an aldehyde.

3,668,184

CHLORAL COPOLYMERS

Otto F. Vogl, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 731,622, May 23, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 580,217, Sept. 19, 1966, now abandoned, and 558,631, June 29, 1966, now abandoned. This application Dec. 19, 1969, Ser. No. 886,739
Int. Cl. C08g *1/12, 9/18*
U.S. Cl. 260—67 TN 25 Claims

Chloral is copolymerized with one or more isocyanate, isothiocyanate, diisocyanate, diisothiocyanate or ketene compounds to produce copolymers which are nonflammable and which can be made into a variety of useful, shaped objects. The process of making the copolymers involves preparing a homogeneous mixture of monomers and polymerization initiator at a temperature above the threshold polymerization temperature of the mixture, cooling the homogeneous mixture below the threshold polymerization temperature and maintaining the homogeneous mixture quiescent during the polymerization.

3,668,185

PROCESS FOR PREPARING THERMOPLASTIC POLYURETHANE ELASTOMERS

Stephen P. Boutsicaris, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 823,178, May 8, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 683,803, Nov. 17, 1967, now abandoned. This application Jan. 8, 1971, Ser. No. 105,084
Int. Cl. C08g *22/16*
U.S. Cl. 260—75 NH 8 Claims

This disclosure relates to a process for the preparation of thermoplastic urethane polymers or elastomers also having urethane and urea linkages derived by the reaction of the adduct of 6-caprolactam and an alkylene diamine, this adduct having the formula $NH_2(CH_2)_5CONH(CH_2)_xNH_2$ in which x has a value of 2–8, with a urethane prepolymer. The resulting urethane-urea elastomer has improved properties in comparison with such elastomers prepared from urethane prepolymers and 4,4′-methylene-bis-2-chloroaniline, generally referred to as "MOCA", or lauroguanamine which are the commonly used diamines for such purpose. In addition to the improved properties compared to the elastomers prepared from MOCA and aliphatic diamines, the product of this process has a considerably longer pot life and the reaction can be carried out at relatively elevated temperatures without gel formation. These elastomers are suitable for preparing melt-spun spandex fibers of high tenacity and melting temperature.

3,668,186

COMPOSITION FOR LOWERING THE RELEASE TEMPERATURE OF PHENOL- AND LOWER ALKYL SUBSTITUTED PHENOL-BLOCKED ISOCYANATES

Joe S. Duncan, Mogadore, and Otto C. Elmer, Akron, both of Ohio, assignors to The General Tire & Rubber Company

Filed Apr. 17, 1970, Ser. No. 29,648
Int. Cl. C08g *22/34*; C09k *3/00*
U.S. Cl. 260—75 NC 16 Claims

In the preparation of urethane polymers from phenol- and lower alkyl substituted phenol-blocked isocyanates, it is known to use a variety of reagents such as organotin compounds or amine compounds to lower the temperature at which the isocyanate becomes unblocked or reactive. These compounds, however, cause various side effects such as a decrease in the heat stability of the resultant polyurethane. This invention concerns a novel combination of certain tetravalent organotin compounds and certain quaternary ammonium compounds for addition to a phenol- or lower-alkyl substituted phenol-blocked isocyanate system to produce a synergistic lowering of the unblocking temperature in addition to, in the case of a coating compound, providing an unexpected increase in the heat stability of the resultant polyurethane coating.

3,668,187

THERMALLY STABLE POLYESTER FIBERS HAVING IMPROVED DYEABILITY

Henry L. King; Eugene L. Ringwald, both of Cary, N.C., and James C. Randall, Bartlesville, Okla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 789,528, Jan. 7, 1969, now abandoned. This application May 13, 1969, Ser. No. 824,092
Int. Cl. C08g *17/08*
U.S. Cl. 260—77 8 Claims

Thermally stable fiber-forming polyester having improved dyeability with disperse dyes are produced from dicarboxylic acids, or reactive derivatives thereof, glycols and small amounts of mixtures of compounds having a typical general formula: R—O[G—O]$_x$—H where R is an alkyl group containing an average of from about eight to 20 carbon atoms; G is a hydrocarbon radical selected from the group consisting of ethylene, propylene and isomers thereof, butylene and isomers thereof, and mixtures of the above; and x has an average value of from 8–20, and is about equal to or greater than R. Polyfunctional chain-branching agents in amounts up to about 0.73 mole percent, based on the weight of the dicarboxylic acid or ester-forming derivative thereof, may be added, whereby the polymer, with the chain terminators described above, can be polymerized to higher molecular weights by ordinary polymerization techniques.

3,668,188

THERMALLY STABLE POLYESTER FIBERS HAVING IMPROVED DYEABILITY AND DYE LIGHTFASTNESS

Henry L. King; Eugene L. Ringwald, both of Cary, N.C., and James C. Randall, Bartlesville, Okla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 824,092, May 13, 1969, and a continuation-in-part of 789,528, Jan. 7, 1969, now abandoned. This application Nov. 3, 1969, Ser. No. 873,333
Int. Cl. C08g *17/08*
U.S. Cl. 260—77 3 Claims

Modified polyester filaments having over conventional filaments, improved inherent thermal stability in the presence of oxygen and inherent disperse dye uptake, without the significant loss in dye lightfastness typical of such modified filaments, are produced from terephthalic acid; glycols; small amounts of mixtures of compounds having a typical general formula: R—O[G—O]$_x$—H, where R is an alkyl group containing an average of from about eight to 20 carbon atoms; G

is a hydrocarbon radical selected from the group consisting of ethylene, propylene, and isomers thereof, butylene and isomers thereof, and mixtures of the above; and x has an average value of from 8—20, and is about equal to 8–greater than R; and small amounts of manganous ion. Polyfunctional chain-branching agents in amounts up to about 0.7 mole percent, based on the weight of the dicarboxylic acid or ester-forming derivative thereof, may be added, whereby the polymer, with the chain terminators described above, can be polymerized to higher molecular weights by ordinary polymerization techniques.

3,668,189

FLUORESCENT POLYCARBONAMIDES

Frederick J. Goetz, Cedar Knolls, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,603
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **4 Claims**

Nylons are conventionally prepared by the condensation polymerization of diamines with dibasic acids. If there is incorporated into the polymerization charge from about 0.1 to 100 moles per 10,000 moles of conventional dibasic acid; a diacid, diester, diamide diacid chloride or diamidediamine of a fusedrring, polynuclear aromatic hydrocarbon having at least three fused rings, the thereby resulting nylon is fluorescent.

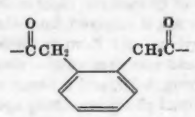
3,668,190

POLYAMIDES CONTAINING THE O-PHENYLENEDIACETIC ACID MOICTY

James S. Ridgway, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 751,729, Aug. 12, 1968, now abandoned. This application Dec. 23, 1970, Ser. No. 101,133
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **4 Claims**

Polyamides modified to contain as an integral part of their polymer chain units represented by the structure



possess a red color and can be fabricated into shaped articles, such as fibers, to provide red articles without the aid of pigments or dyes.

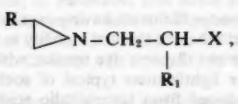
3,668,191

ADDUCTS OF N-SUBSTITUTED AZIRIDINES AND ORGANIC ACID ANHYDRIDES

Harry A. Smith, Midland, and Bobbie E. Rooker, Hope, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 9, 1970, Ser. No. 96,604
Int. Cl. C08f *25/00*; C08g *33/08*
U.S. Cl. 260—78.4 R **10 Claims**

Novel resins are prepared by reacting (a) maleic or succinic anhydride with (b) an aziridine of the formula



wherein R and R_1 are hydrogen or lower alkyl; and X is hydroxy, amino or cyano. The resins are useful contact adhesives.

3,668,192

CROSS-LINKED ISOTACTIC POLYBUTENE-1

Friederich Seifert, Marl; Josef Bittscheidt, Datteln, and Johannes Plenikowski, Marl, all of Germany, assignors to Chemische Werke Huls A.G., Marl, Germany

Original application May 26, 1966, Ser. No. 553,014, now Patent No. 3,546,326, dated Dec. 8, 1970. Divided and this application Mar. 12, 1970, Ser. No. 26,464
Int. Cl. C08f *27/00*
U.S. Cl. 260—79.5 P **9 Claims**

Isotactic polybutene-1 is cross-linked with sulfur and an organic peroxide which decomposes at 140–220°C, e.g., dicumyl-peroxide.

3,668,193

VINYLIDENE FLUORIDE COATING COMPOSITIONS CONTAINING POLYIMIDES

James Ping King, Lansdale, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 27, 1971, Ser. No. 110,258
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PA **15 Claims**

This disclosure concerns vinylidene fluoride polymer compositions containing a minor proportion of polyamide-acid resin which, after heat-curing of the composition, is converted to a polyimide resin. The coatings and films made from the cured composition have self-lubricating characteristics, improved wear resistance and impact resistance and better adhesion to substrates.

3,668,194

SUSPENSION POLYMERIZATION OF PVC POLYMERS AND COPOLYMERS AT REDUCED TEMPERATURES

Pink Kang Shen, Leominster, Mass., assignor to Borden, Inc., New York, N.Y.

Filed Dec. 14, 1966, Ser. No. 601,557
Int. Cl. C08f *3/30, 15/24, 15/06*
U.S. Cl. 260—86.3 **5 Claims**

This invention relates to vinyl chloride polymerization products and to the process of making such products comprising the steps of polymerizing in suspension and at temperatures below about 100° F. monomers consisting of at least 60 percent by weight of vinyl chloride in the presence of an organic peroxy compound, a reducing agent, and a metallic accelerator.

3,668,195

PROCESS FOR PRODUCING FIBRIDS FROM LATEX FOAM

Willem Jan Van Der Geer, Oosterbeek, Netherlands, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 16, 1968, Ser. No. 768,168
Claims priority, application Netherlands, Oct. 20, 1967, 6714246
Int. Cl. C08d *5/00*; C08c *1/14*
U.S. Cl. 260—94.7 R **4 Claims**

Paper-like and non-woven sheet-form articles of superior properties are produced by a process in which an aqueous latex of a polymeric binder material of natural or synthetic origin is first foamed, as by beating with air, the resulting foamed latex mixed with a coagulant under vigorous agitation to form directly an aqueous suspension of mainly flocculent particles of uniform particle size distribution, the resulting suspension of binder particles admixed with an aqueous suspension of fibers and the resulting mixed suspension dewatered to form a sheet which is then dried. The binder particles obtained by coagulation of a foamed latex produce products of higher wet and dry strengths and are more efficient in that more of the binder is retained by the fibers and less is lost in the dewatering operation.

3,668,196

3-AZETIDINOLS

William W. Hargrove, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Original application Oct. 22, 1965, Ser. No. 502,331, now Patent No. 3,481,920, dated Dec. 2, 1969. Divided and this application Jan. 13, 1969, Ser. No. 790,856

Int. Cl. C07d *25/00*

U.S. Cl. 260—239 A 3 Claims

2,2-Disubstituted-azetidines, optionally substituted in addition at the 1,3, and 4 positions, useful as CNS stimulants and as blood pressure-lowering agents.

3,668,197

ESTERS AND AMIDES OF (DIAZOMETHYL) PHOSPHONIC ACID

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed July 22, 1969, Ser. No. 843,763

Int. Cl. C07c *113/02*; C07f *9/32*; C07d *1/12*

U.S. Cl. 260239 AA 3 Claims

A method for the preparation of (cis-1,2-epoxypropyl)-phosphoric acid diesters and diamides which comprises treating the corresponding diester or diamide of (diazomethyl)-phosphonic acid with acetaldehyde or, alternatively, treating a mixture of an appropriate diester or diamide of formylphosphonic acid with diazoethane. The (cis-1,2-epoxypropyl) acid diesters and diamides thus obtained have utility as intermediates inasmuch as they may be converted to the pharmacologically active (cis-1,2-epoxypropyl)phosphonic acid and to the salts thereof which inhibit the growth of gram-positive and gram-negative pathogenic bacteria.

3,668,198

α-UREIDO-2,4,6-CYCLOHEPTATRIENYLMETHYLPENICILLINS

Jack Bernstein, New Brunswick; Patrick Andrew Diassi, Westfield, and Frank Lee Weisenborn, Somerset, all of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 1, 1970, Ser. No. 42,600

Int. Cl. C07d *99/16*, *99/24*

U.S. Cl. 260—239.1 12 Claims

This invention relates to α-ureido-2,4,6-cycloheptatrienylmethylpenicillins as well as their salts, which are useful as antibacterial agents.

3,668,199

1,3-AMINOALCOHOLS

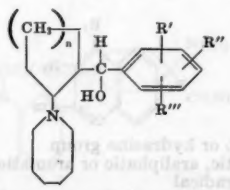
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Original application June 13, 1966, Ser. No. 556,892, now Patent No. 3,558,599, which is a division of application Ser. No. 786,385, Dec. 23, 1968, now Patent No. 3,595,867. Divided and this application Oct. 30, 1970, Ser. No. 85,718

Int. Cl. C07d *41/04*

U.S. Cl. 260—239 B 10 Claims

Novel 1,3-aminoalcohol of the formula



(IV)

wherein *n* has the value of 1 to 4, inclusive, wherein R′, R″, and R‴ are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, and alkoxy of 1 to 6 carbon atoms, inclusive, or CF_3, are prepared. The new compounds of formula IV per se as well as in the form of acid addition salts have diuretic activity and some of them have antihyperglycemic activity. Compounds of formula IV are thus useful to provide diuretics in mammals and are also useful as oral antidiabetic agents.

3,668,200

PROCESS FOR THE PRODUCTION OF ISOXAZOLYL PENICILLINS

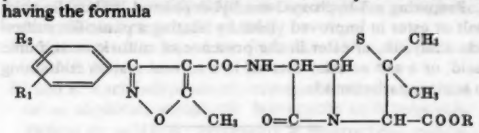
Jinnosuke Abe, Yoshida; Tetsuo Watanabe, Yokohama-shi; Teruo Take, Tagata-gun; Kentaro Fujimoto, Tagata-gun; Tadashiro Fujii, Tagata-gun; Kazunari Takemura, Tagata-gun; Kazuyoshi Nishiie, Numazu-shi; Sakae Satoh, Sakai-shi; Tadashi Koide, and Yasue Hotta, both of Tagata-gun, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Tagata-gun, Japan

Filed Sept. 24, 1969, Ser. No. 860,812

Int. Cl. C07d *99/16*

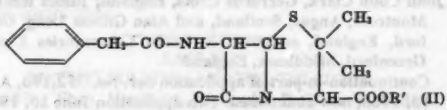
U.S. Cl. 260—239.1 6 Claims

A chemical process for the production of isoxazolyl penicillins and nontoxic salts and lower alkyl esters thereof having the formula



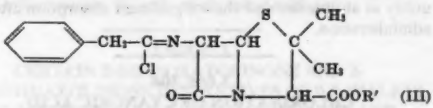
(I)

requires no microbiological deacylation or fermentation to produce 6-aminopenicillanic acid, but instead comprises reacting a penicillin G ester having the formula



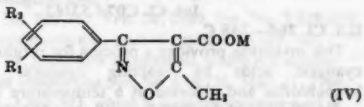
(II)

wherein R′ is a protective group for carboxyl group and is selected from the group consisting of lower alkyl and a group which, when subjected to an elimination reaction, can be easily eliminated without having any detrimental effect on the structure of penicillin, which a chlorinating agent in the presence of a tertiary organic base to obtain an imide chloride group-incorporated compound having the formula



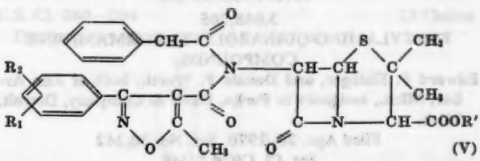
(III)

wherein R′ is as defined above; reacting the compound of Formula III with an isoxazol carboxylate having the formula



(IV)

wherein M is a metal atom, and R_1 and R_2 are as defined above, to obtain a diacyl penicillin ester having the formula



(V)

wherein R_1, R_2 and R′ are as defined above; then subjecting the compound of Formula V to dephenylacetylation; and eliminating R′ when R′ is a said easily eliminated group.

3,668,201

CEPHAM COMPOUNDS

Gerald E. Gutowski, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 24, 1970, Ser. No. 13,814
Int. Cl. C07d *99/24, 99/16*
U.S. Cl. 260—243 C 6 Claims

3-Hydroxy-3-methyl-7-(protectedamino)cepham-4-carboxylic acids and salts, and esters which are useful as intermediates in the production of desacetoxycephalosporin antibiotic compounds.

3,668,202

PROCESS FOR PREPARING CEPHAM COMPOUNDS

Bennie J. Foster, Greenwood; Gerald E. Gutowski, and Lowell D. Hatfield, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 24, 1970, Ser. No. 13,815
Int. Cl. C07d *99/24, 99/14*
U.S. Cl. 260—243 C 10 Claims

Preparing a 3-hydroxy-3-methyl-cepham-4-carboxylic acid, salt or ester in improved yields by heating a penicillin sulfoxide acid, salt, or ester in the presence of sulfuric or sulfamic acid, or a salt or ester thereof in a solvent system containing a tertiary carboxamide.

3,668,203

CEPHALOSPORIUS HAVING A THIOLTHERIFIED METHYL GROUP IN THE 3-POSITION

John Colin Clark, Gerrards Cross, England; James Kennedy, Montrose, Angus, Scotland, and Alan Gibson Long, Greenford, England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Continuation-in-part of application Ser. No. 752,190, Aug. 13, 1968, now abandoned. This application June 13, 1969, Ser. No. 833,150
Claims priority, application Great Britain, June 14, 1968, 28,527/68
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C 11 Claims

7β-acylamidoceph-3-em-4-carboxylic acids having a thioetherified methyl group at the 3-position and physiologically acceptable derivatives thereof. The compounds have utility as antibiotics and show significant absorption after oral administration.

3,668,204

CHLORINATION OF CYANURIC ACID

Raymond N. Mesiah, Somerset, N.J., assignor to FMC Corporation, New York, N.Y.

Filed Aug. 21, 1970, Ser. No. 66,105
Int. Cl. C07d *55/42*
U.S. Cl. 260—248 C 7 Claims

This invention provides a process for producing chloroisocyanuric acids by reacting cyanuric acid, sodium hypochlorite and chlorine at a temperature above zero° C. and preferably below 25° C., until the pH is between 1.7 and 3.5.

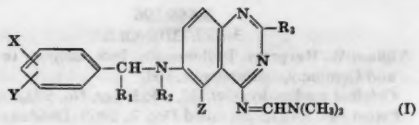
3,668,205

BENZYLAMINO QUINAZOLINYL FORMAMIDINE COMPOUNDS

Edward F. Elslager, and Donald F. Worth, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Apr. 20, 1970, Ser. No. 30,242
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.4 Q 6 Claims

Benzylamino quinazolinyl formamidine compounds (I) and their acid salts



(I)

are provided by amidination of the corresponding 2,4-diamino or 2-amino-4-dimethylamidino compounds where R_1 is hydrogen or methyl; R_2 is hydrogen, nitroso, formyl, acetyl, propionyl or lower alkyl; R_3 represents amino or dimethylformamidino; and X, Y and Z are hydrogen, chloro or methyl. The compounds are pharmacological agents having useful antiparasitic properties, especially antimalarial properties.

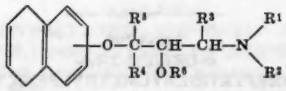
3,668,206

HETEROCYCLIC AMINE DERIVATIVES OF 5,8-DIHYDRONAPHTHYLOXY PROPANOLS

Venkatachala Lakshmi Narayanan, 703a North Village, North Brunswick; Linda Louise Setescak, R.D. No. 1, Box 121, Cranbury, and Frank Lee Weisenborn, 21 Denherder Dr., Somerset, all of N.J.

Original application Oct. 16, 1968, Ser. No. 768,176, now Patent No. 3,354,085, dated Oct. 13, 1970. Divided and this application Jan. 26, 1970, Ser. No. 5,993
Int. Cl. C07d *51/70, 29/10*
U.S. Cl. 260—268 BC 9 Claims

This invention relates to new 5,8-dihydronaphthyloxy-aminopropanols and related compounds of the formula



wherein

are piperidino and other heterocyclic derivatives and to salts of such compounds, products which are useful in coronary diseases, water softening and corosion inhibition.

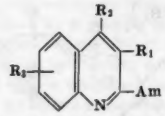
3,668,207

2-AMINO-4-ARYL-QUINOLINES

Richard William James Carney, New Providence, N.J., assignor to Ciba-Geigy Corporation, Summit, N.J.

Continuation-in-part of application Ser. No. 638,594, May 15, 1967, now Patent No. 3,542,785. This application Jan. 22, 1970, Ser. No. 5,146
Int. Cl. C07d *33/52*
U.S. Cl. 260—286 R 6 Claims

2-Amino-4-aryl-quinolines, e.g. those of the formula



Am = an amino or hydrazino group
R_1 = H, aliphatic, araliphatic or aromatic radical
R_2 = aromatic radical
R_3 = H, alkyl, alkoxy, alkylmercapto, halogeno, CF_3, NO_2 or amino

acyl derivatives, quaternaries and salts thereof, exhibit antiinflammatory effects.

3,668,208

HEXAHYDRO IMIDAZOQUINOLINES

Charles A. R. Baxter, Sandwich, England, assignor to Pfirer Inc., New York, N.Y.

Filed Feb. 13, 1970, Ser. No. 11,308
Claims priority, application Great Britain, Feb. 19, 1969, 8,882/69
Int. Cl. C07d 49/36
U.S. Cl. 260—283 S 10 Claims

A series of novel substituted hexahydro imidazoquinoline compounds have been prepared from the corresponding 2-aminomethyl-1,2,3,4-tetrahydroisoquinolines. These compounds are useful in the field of chemotherapy as anti-schistosomal agents. Preferred members include 2-(lower alkyl)-7-methyl-8-nitro-1,2,3,3a,4,5-hexahydroimidazo-[1,5-a]-quinolines, 2-(lower alkyl)-7-hydroxymethyl-8-nitro-1,2,3,3a,4,5-hexahydroimidazo-[1,5-a]-quinolines and 2-(lower alkyl)-7-methyl-8-chloro-1,2,3,3a,4,5-hexahydroimidazo-[1,5-a]-quinolines, as well as various 1- and 9-substituted derivatives thereof.

3,668,209

SEPARATION OF CHLORINATED PYRIDINES AND DERIVATIVES THEREOF

Demetrios Kyriacou, Oakley, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 784,226, Dec. 16, 1968, now abandoned. This application Apr. 8, 1971, Ser. No. 132,550
Int. Cl. C07d 31/16
U.S. Cl. 260—290 A 10 Claims

The present disclosure is directed to a method for separating halogen substituted pyridines having an unhindered hydrogen atom in a position alpha or beta to the ring nitrogen from closely related halogen substituted pyridines which lack such a hydrogen atom. The separation is carried out by contacting a mixture of the above pyridines with sulfuric acid or an alkane sulfonic acid in the presence of a solvent for those species not possessing an unhindered hydrogen atom followed by a hydrolysis step. This method can also be employed to separate isometric polychloropyridines from each other.

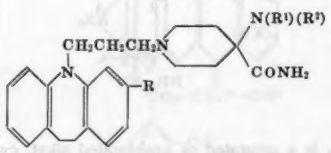
3,668,210

3-CHLORO DIHYDRODIBENZAZEPINE DERIVATIVES

Michio Nakanishi, Oita, and Chiaki Tashiro, Fukuoka, both of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Feb. 3, 1969, Ser. No. 796,163
Claims priority, application Japan, Feb. 7, 1968, 43/7571
Int. Cl. C07d 41/0 8
U.S. Cl. 260—293.59 5 Claims

New dibenzazepine derivatives of the formula



wherein R is Cl, OCH_3, CH_3, or $COCH_3$, and $-N(R^1)(R^2)$ is dimethylamino or piperidino, as well as pharmaceutically acceptable acid addition salts thereof, are useful as psychotropic agents.

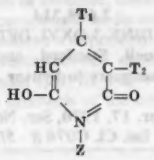
3,668,211

CERTAIN 6-HYDROXY 2-(1H) PYRIDONES

Allen Crabtree, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of application Ser. No. 860,030, Sept. 22, 1969, now abandoned. This application Oct. 30, 1969, Ser. No. 872,745
Claims priority, application Great Britain, Dec. 9, 1968, 58,281/68; Dec. 11, 1968, 58,834/68
Int. Cl. C07d 31/46
U.S. Cl. 260—294.9 2 Claims

Compounds of the formula



wherein T_1 represents a hydrogen atom or a group of the formula —$COOR^1$ or $CONR^1R^2$, or an aliphatic, araliphatic, homocyclic or heterocyclic radical,

T_2 represents a group of the formula $-CN$, $-COOR^1$ or $CONR^1R^2$,

R^1 and R^2 each independently represents a hydrogen atom or an aliphatic, araliphatic, homocyclic or heterocyclic radical or $-NR^1R^2$ represents a heterocyclic radical, and Z represents an aliphatic radical having a primary or secondary amono group substituted therein, are valuable dyestuff intermediates being useful as coupling components for the manufacture of a wide variety of azo compounds.

3,668,212

METHYLSULFINYLMETHYLTHIAZOLE

Tsung-Ying Shen, Westfield; Alexander R. Matzuk, Colinia, and Conrad P. Dorn, Jr., Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Original application Dec. 12, 1968, Ser. No. 783,430, now Patent No. 3,551,444, which is a division of application Ser. No. 592,977, Nov. 9, 1966, now Patent No. 3,438,992. Divided and this application June 10, 1970, Ser. No. 45,245
Int. Cl. C07d 91/32
U.S. Cl. 260—302 R 3 Claims

Anti-inflammatory thiazole methylalkyl sulfoxides.

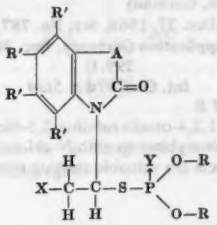
3,668,213

CERTAIN 2-BENZOXAZOLINONE AND 2-BENZOTHIAZOLINONE DERIVATIVES OF 0,0-DIALKYL S-(2-HALOETHYL) PHOSPHOROTHIOATES AND DITHIOATES

Joel D. Jamison, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 801,767, Feb. 24, 1969, Pat. No. 3,529,059, which is a continuation-in-part of application Ser. No. 601,553, Dec. 14, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 535,735, Mar. 21, 1966, now Patent No. 3,355,353, which is a continuation in-part of application Ser. No. 417,516, Dec. 10, 1964, now abandoned. This application May 20, 1970, Ser. No. 51,032
Int. Cl. C07d 91/24
U.S. Cl. 260—304 23 Claims

Disclosed are compounds of the formula:



wherein each R is a lower alkyl radical, Y is selected from the group consisting of the oxo and thioxo radicals, X is a halo radical, A is selected from the group consisting of the oxy and thio radicals, and each R' is selected from the group consisting of the hydrogen and halo radicals. These compounds are highly toxic to southern army worm larvae.

3,668,214

OXAZOLIDINE-3-OXYL DERIVATIVES

Harden M. McConnell, Stanford, and Edwin F. Ullman, Atherton, Calif., assignors to Synvar Associates, Palo Alto, Calif.

Filed Apr. 17, 1970, Ser. No. 29,661
Int. Cl. C07d 8 5/26
U.S. Cl. 260—307 F 5 Claims

Novel oxazolidine-3-oxyl compounds, wherein the two carbon of the oxazolidine ring is a carbon in the chain of palmitoleic acid, e.g. cis-2-(11-carboxy-3-undecenyl)-2-propyl-4,4-diethyloxazolidine-3-oxyl, which are useful as spin labels for biological membranes, are prepared by reaction of a 2-amino-2-lower alkyl-alkanol with an oxopalmitoleic acid, the resulting product oxidized to the corresponding oxazolidine-3-oxyl.

3,668,215

ARYL-SULPHONYL-SEMICARBAZIDES CONTAINING HETEROCYCLIC ACYLAMINO GROUPS

Hans Plumpe, and Walter Puls, both of Wuppertal-Elberfeld, Germany, assignors to Farvenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 12, 1968, Ser. No. 775,138
Claims priority, application Germany, Nov. 25, 1969, P 16 70 952.7
Int. Cl. C07d 8 5/24
U.S. Cl. 260—307 H 12 Claims

Oral antidiabetic aryl-sulphonyl-semicarbazides having heterocyclic acylamino groups and pharmaceutical compositions are provided. Typical embodiments are represented by the compounds 4-{{4-{β-[3-methyl-isoxazolyl-(5)-carboxamido]-ethyl}-benzene-sulphonyl}}-1,1-hexa-methylene-semicarbazide, 4-[4-{β-[4,5-tetramethylene-isoxazolyl-(3)-carboxamido]-ethyl}-benzene-sulphonyl]-1,1-hexa-methylene-semicarbazide and 4-[3-{β-[5-methyl-isoxazolyl-(3)-carboxamido]-ethyl}-benzene-sulphonyl]-1,1-hexamethylene-semicarbazide which are administered in dosages of 1—10 mg/kg to a diabetic host formulated with excipients and tableted or filled into gelatin capusles.

3,668,216

PRODUCTION OF 1,2,4-OXADIAZOLIDINE-3,5-DIONES

Albrecht Zschocke, Bad Duerkheim, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 27, 1968, Ser. No. 787,624
Claims priority, application Germany, Dec. 30, 1967, P 16 70 299.1
Int. Cl. C07d 8 5/34
U.S. Cl. 260—307 B 5 Claims

Production of 1,2,4-oxadiazolidine-3,5-diones by reaction of substituted hydroxylamines with N-chloroformyl-carbamic esters. The products are valuable starting materials for dyes.

3,668,217

3-(3',5'-DIHALOGENOPHENYL)IMIDAZOLIDINE-2,4-DIONE DERIVATIVES

Akira Fujinami, Ashiya-shi; Toshiaki Ozaki, Toyonaka-shi; Fukashi Horiuchi, Saitama-ken; Sigeo Yamamoto, Toyonaka-shi; Keiichiro Akiba, Ikeda-shi; Katsutoshi Tanaka, Takarazuka-shi; Shigehiro Ooba, Takarazuka-shi; Tadashi Ooishi, Minoo-shi; Katsuji Nodera, Nishinomiya-shi, and Nobuyuki Kameda, Takarazuka-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Nov. 14, 1969, Ser. No. 876,987
Claims priority, application Japan, Nov. 25, 1968, 43/86483; May 13, 1969, 44/37160
Int. Cl. C07d 47/32
U.S. Cl. 260—309.5 9 Claims

3-(3',5'-Dihalogenophenyl)imidazolidine-2,4-dione derivatives, which may be substituted with alkyl or phenyl in the 1 and/or 5 positions, are new compounds, and have high microbicidal activity on various fungi and bacteria and are non-toxic to plants and mammals. Those compounds are prepared by the intramolecular cyclization of a corresponding urea derivatives.

3,668,218

COPPER PHTHALOCYANINESULPHONIC ACIDS

Hans Von Tobel, Riehen/Basel-land, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Filed Mar. 6, 1970, Ser. No. 17,297
Claims priority, application Switzerland, Mar. 25, 1969, 4469/69
Int. Cl. C07d 27/74
U.S. Cl. 260—314.5 6 Claims

Copper phthalocyaninesulphonic acids which contain on the average 2 to 3 sulphonic acid groups, of which 1 to 1.8 are in 4-positions and the remainder in 3-positions, are suitable for exhaustion dyeing, pad dyeing and printing of natural and synthetic polyamide fibers, polyurethane fibers, natural and regenerated cellulosic fibers and leather.

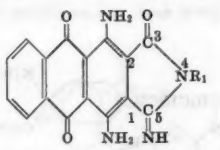
3,668,219

PREPARING WATER INSOLUBLE ANTHRAQUINONE DYESTUFFS

Tokio Otsuka, Ashiya; Shozo Sasabe, Ibaragi, and Hiroyuki Nakagawa, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Apr. 1, 1970, Ser. No. 24,828
Claims priority, application Japan, Apr. 9, 1969, 44/27500
Int. Cl. C07d 27/50
U.S. Cl. 260—325 7 Claims

Improvement for preparing water insoluble anthraquinone dyestuffs represented by the formula,



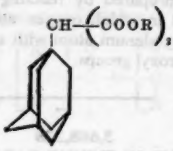
wherein R_1 is a saturated or unsaturated alkyl, cycloalkyl, aryloxyalkyl, aralkyl, aralkoxyalkyl or hydroxyalkyl having two to 12 carbon atoms, which comprises reacting 1-hydroxy-3-imino-4,7-diamino-5,6-phthalylisoindolenine or its tautomer with an alkylating agent in water or in an aqueous medium containing a small amount of an organic solvent.

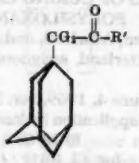
3,668,220
ADAMANTANE COMPOUNDS

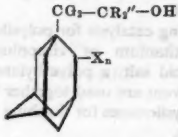
Stephen S. Szinai, Wokingham, and William H. W. Lunn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

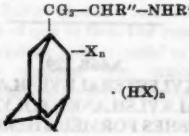
Original application Oct. 13, 1967, Ser. No. 675,037, now Patent No. 3,591,642. Divided and this application Apr. 27, 1970, Ser. No. 32,406
Int. Cl. C07d 27/28
U.S. Cl. 260—326.11 2 Claims

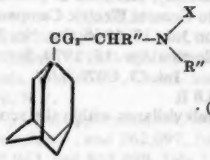
The present invention is directed to adamantane compounds of the formula:

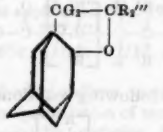
(I)


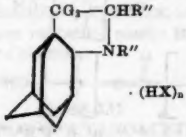
(II)


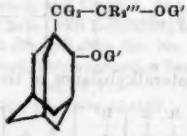
(III)


(IV)


(V)


(VI)


(VII)


(VIII)


wherein each G independently represents hydrogen or straight-chain alkyl of from one to six, both inclusive, carbon atoms; G' represents hydrogen or acetyl; R represents hydrogen or alkyl of from one to six, both inclusive, carbon atoms; R' represents halo, alkoxy containing from one to six both inclusive, carbon atoms in the alkyl group, hydrogen or alkyl of from one to six, both inclusive, carbon atoms; each R'' independently represents hydrogen or alkyl of from one to six, both inclusive, carbon atoms; each R''' independently represents hydrogen or alkyl of from one to six, both inclusive, carbon atoms or both R''' groups taken together represent oxo(—O); X represents halo; and each *n* independently represents an integer of from zero to one, both inclusive. The terms "halo" and "halide" are employed herein to designate occurrences of bromine, chlorine and iodine.

The adamantane compounds of formula VII AND VIII are useful as agents to achieve a depressant action on the central nervous system of warm blooded animals. The adamantane compounds of formulas I, II, III, IV, V and VI are useful as intermediates in the synthesis of the compounds of formulas VII and VIII.

3,668,221
PROCESS FOR PRODUCING α-AMINO ACIDS

Takesaburo Shima; Akio Yamagishi; Masao Sada; Zenichi Yamamoto, and Hasunaga Shiozaki, all of Niihama-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed July 21, 1967, Ser. No. 655,137
Claims priority, application Japan, July 28, 1966, 41/49736
Int. Cl. C07d 27/60; C07c 99/08
U.S. Cl. 260—326.14T 11 Claims

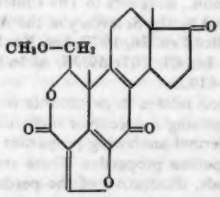
A process for producing α-amino acid by hydrolyzing a hydantoin compound in which the hydrolysis is effected while withdrawing out of the system ammonia and carbon dioxide generated during the hydrolysis and while during the reaction period, adjusting the amount of reaction medium to at least 1.5 *l.* per mole of the hydantoin compound initially employed. Particularly, a process in which the hydrolysis is effected in such a manner that an aqueous alkaline solution of hydantoin compound is fed to the upper part of a plate column-type reactor or packed column-type reactor and, simultaneously, steam is fed from the lower part of said reactor, while withdrawing ammonia and carbon dioxide out of the system. By thus effecting the hydrolysis without concentrating the reaction liquid, and while withdrawing the generated gases out of the system, α-amino acid can be produced in high yields.

3,668,222
11-DESACETOXY-WORTMANNIN

Daniel Hauser, Reinach, Switzerland; assignor to Sandoz Ltd., Basel, Switzerland

Filed May 6, 1970, Ser. No. 35,300
Claims priority, application Switzerland, May 14, 1969, 7389/69; Sept. 10, 1969, 13485/69
Int. Cl. C07d 7/18
U.S. Cl. 260—343.2 R 1 Claim

The invention concerns the novel antibiotic 11-desacetoxy-wortmannin of the formula:



The antibiotic is a fungistatic and anti-inflammatory/edema-inhibiting agent.

3,668,223

2-OXO-3-BENZOXEPINS

Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1970, Ser. No. 65,354
Int. Cl. C07d 9/00
U.S. Cl. 260—343.2 R 2 Claims

2-Oxo-3-benzoxepin-6a-carboxylic acid derivatives useful as anti-inflammatory agents.

3,668,224

PROCESS OF PRODUCING 6A, 10A-TRANS-6A,7,8,10A-TETRAHYDRODIBENZO (B,D)-PYRANS

Theodor Petrzilka, 6 Rigistrasse, Erlenbach ZH 8703, Switzerland

Original application Sept. 16, 1968, Ser. No. 760,055, now abandoned. Divided and this application July 2, 1970, Ser. No. 52,105
Int. Cl. C07d 7/20
U.S. Cl. 260—345.3 11 Claims

This invention is directed to a process of producing (−)−1-hydroxy-3-n-amyl-6,6,9-trimethyl-6a,10a-trans-6a,7,8,10a-tetrahydrodibenzo(b,d)-pyran and related pyrans from resorcinols, including intermediates therein. The pyrans produced by this invention possess psychotomimetic and analgesic activity.

3,668,225

PROCESS FOR THE PREPARATION OF N,N'-DI-1-ANTHRAQUINONYLPHTHALAMIDE

John F. Santimauro, Wyckoff, N.J., and Herman Gerson, New York, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 6, 1969, Ser. No. 822,227
Int. Cl. C09b 1/42
U.S. Cl. 260—368 9 Claims

Reaction of a phthalic anhydride with an aminoanthraquinone in the presence of phosphorus oxychloride and/or phosphorus trichloride with perchloroethylene as solvent affords N,N'-di-anthraquinonylphthalamide pigment in high yield and in easily isolatable form. In the preparation of N,N'-di-1-anthraquinonylphthalamide, presence of an "active oxygen"-containing compound in the reaction medium affords a reddish-yellow alpha polymorph; absence of an "active oxygen"-containing compound affords a novel greenish-yellow beta polymorph.

3,668,226

STRAIGHT CHAIN ALIPHATIC CARBOXYLIC ACID MONOESTERS OF 1,3-DIHYDROXY-2-PROPANONE

Ronald P. Quintana; Lorrin R. Garson; Andrew Lasslo, all of Memphis, Tenn., assignors to The United States of America as represented by the Secretary of the Army

Filed Feb. 26, 1970, Ser. No. 14,417
Int. Cl. C07c 69/28; A01n 9/24
U.S. Cl. 260—410.6 1 Claim

This invention relates to perdurable insect repellent compositions comprising a precursor molecule which includes a moiety with dermal anchoring properties linked to a moiety with insect repellent properties. There are also described six new compounds, illustrative of the perdurable insect repellent structure. The six compounds are monoesters of 1,3-dihydroxy-2-propanone and the straight-chain aliphatic carboxylic acids—propanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic acid, and undecanoic acid.

3,668,227

MOLYBDENUM CATALYSTS FOR THE OXIDATION OF UNSATURATED COMPOUNDS IN LIQUID PHASE

Anna Maria Mattucci, Torino, and Emilio Perrotti, San Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Sept. 5, 1969, Ser. No. 855,739
Claims priority, application Italy, Sept. 5, 1968, 20871 A/68
Int. Cl. C07f 11/00; C07d 1/08
U.S. Cl. 260—429 J 7 Claims

A molybdenum alkylene-dioxy-derivative, adapted to catalyze the oxidation of certain compounds containing ethylenic unsaturations, is prepared by reacting an organic molybdenum compound in which oxygen atoms are directly attached to the molybdenum atom with an organic derivative having vicinal hydroxyl groups.

3,668,228

SOLUTIONS OF CURING CATALYSTS FOR POLYSILOXANES

Hans Rudolf Zbinden, Allschwil, and Armin Hiestand, Binningen, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed June 4, 1969, Ser. No. 830,495
Claims priority, application Switzerland, June 13, 1968, 8828/68
Int. Cl. B01j 11/82
U.S. Cl. 252—431 C 8 Claims

Solutions of curing catalysts for polysiloxanes containing a zinc, cadmium, titanium or zirconium salt, an alkylbenzenesulfonic acid salt, a polyethylene glycol compound and an organic solvent are used together with aqueous emulsions of organopolysiloxanes for finishing fiber materials such as paper or textiles.

3,668,229

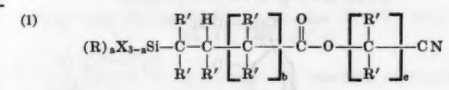
CYANOALKYLESTERALKYLSILANES, AMINOALKYLESTERALKYLSILANES, POLYSILOXANES, AND POLISHES FORMED THEREFROM

Abe Berger, Schenectady, and Jalal S. Jaleel, Albany, both of N.Y., assignors to General Electric Company

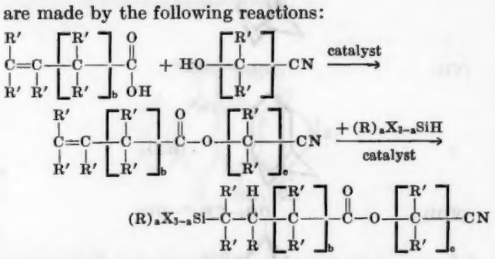
Original application July 17, 1968, Ser. No. 745,377. Divided and this application Apr. 15, 1970, Ser. No. 33,139
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8 R 8 Claims

Cyanoalkylesteralkylsilanes within the scope of the formula:

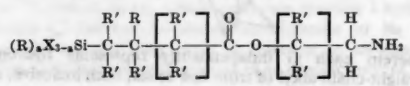
(1)



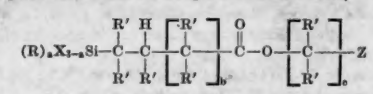
are made by the following reactions:



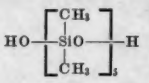
Aminoalkylesteralkylsilanos of the formula:



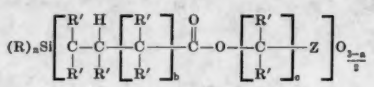
are made by hydrogenating the corresponding nitrile. A compound within the scope of the formula,



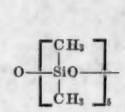
is reacted with a silanol stopped fluid of the formula,



to produce a copolymer containing



units and



blocks.

In the above formulas, R is an organic radical, R′ is an organic radical or hydrogen, X is a hydrolyzable group, Z is a

or a -CN radical, *a* has a value of 0 to 2, *b* has a value of 0 to 4, and *c* has a value of one to five. The copolymer containing cyanoalkylesteralkylsilane units is useful as a solvent resistant protective coating material. The copolymer containing aminoalkylesteralkylsilane units is the primary ingredient of a detergent resistant car polish.

3,668,230

ALKYL-SULFOXIDE AND ALKYL-SULFONE TERMINATED OLIGOMERS

Leland E. Dannals, Waterbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 547,743, May 5, 1966, now abandoned , and 562,097, July 1, 1966, now Patent No. 3,498,943, and 562,098, July 1, 1966, now Patent No. 3,498,942. This application Nov. 19, 1968, Ser. No. 777,175

Int. Cl. C07c *121/28, 121/38, 121/40*

U.S. Cl. 260—465.4 **12 Claims**

Alkyl-sulfoxide and alkyl-sulfone terminated oligomers. Prepared by addition polymerization of monomer in presence of a mercaptan, followed by oxidation. Oligomers used as emulsifiers in the emulsion polymerization of one of more monomers to produce rubber or plastic latexes from which solid polymers can be obtained.

3,668,231

PRODUCTION OF CYANOACETIC ACID

Jacob Rosin, Maplewood, and Frank S. Ang, Kearney, both of N.J., assignors to Chris-Craft Industries, Inc.

Continuation-in-part of application Ser. No. 749,940, Aug. 5, 1968, now abandoned. This application Sept. 9, 1970, Ser. No. 70,915

Int. Cl. C07c *121/40*

U.S. Cl. 260—465.4 **3 Claims**

Cyanoacetic acid is produced in a sequence of reactions in which an aqueous solution of chloroacetic acid neutralized with sodium carbonate or sodium hydroxide to form sodium chloroacetate which, in turn, is reacted in a nucleophilic substitution with an alkali metal cyanide and the resultant cyanoacetate is then acidified to form an aqueous reaction mixture comprising cyanoacetic acid and the respective salts formed in such reaction sequence. This process is improved

a. by conducting the nucleophilic substitution reaction in the presence of an alkanol and at a temperature in excess of about 80° C. to accelerate the reaction while substantially precluding undesirable side reactions, thereby increasing the yield of the cyanoacetate and decreasing the tendency of the reaction to form color bodies; and

b. by extracting the acidified, aqueous reaction mixture with an alkanol which contains from not less than three to about 12 carbon atoms and which is substantially insoluble in saturated brine, using the aqueous reaction mixture in such a manner that the amount of salts in such reaction mixture substantially saturate the amount of water present, thereby permitting substantially all of the cyanoacetic acid to be extracted by the alkanol.

By using these improvements in a process to produce cyanoacetic acid, it is possible to obtain extremely high yields of cyanoacetic acid using much less process equipment than presently employed to produce this product. The improved process furthermore facilitates the subsequent production of alkyl cyanoacetates and of cyanoacetamide.

3,668,232

N-SUBSTITUTED 2-AMINOMETHYL-2′-BIPHENYLCARBOXYLIC ACID AND DERIVATIVES

John O. Hawthorne, and Edward L. Mihelic, both of Penn Hills Township, Allegheny County, Pa., assignors to United States Steel Corporation

Original application May 16, 1969, Ser. No. 825,440, which is a continuation-in-part of application Ser. No. 529,258, Feb. 23, 1966, now abandoned. Divided and this application May 21, 1970, Ser. No. 39,554

Int. Cl. C07c *101/00, 101/42*

U.S. Cl. 260—471 A **7 Claims**

N-substituted 2-aminomethyl-2′-biphenylcarboxylic acid and derivatives thereof are prepared by reacting 2-formyl-2′-biphenylcarboxylic acid or an ester thereof with ammonia or a primary amine with hydrogenation of the product.

3,668,233

ESTERS OF PERFLUORO-TERTIARYALKYL ALCOHOLS AND HYDROCARBYL OR HOLO-HYDROCARBYL CARBOXYLIC ACIDS

Frank J. Pavlik, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of application Ser. No. 538,556, Mar. 30, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 246,022, Dec. 20, 1962, now abandoned , which is a continuation of application Ser. No. 234,222, Oct. 30, 1962, now Patent No. 3,385,904. This application Apr. 17, 1970, Ser. No. 28,242

Int. Cl. C07c *69/14, 69/54, 101/68*

U.S. Cl. 260—471 C **6 Claims**

An ester condensation product of (1) a perfluoro-tertiary-alkyl alcohol in which the perfluoro-alkyl group has not more than 20 carbon atoms, is directly bonded to the alcoholic hydroxyl radical, and has at least one perfluoro-methyl group bonded to the tertiary carbon atom, and (2) an organic acid of not more than 18 carbon atoms with at most double bond unsaturation and selected from the group consisting of a hydrocarbon carboxylic acid, a hydrocarbon sulphonic acid, a hydrocarbon phosphonic acid, a hydrocarbon silicic acid or cyanuric acid, or a halogen substituted counterpart thereof. Illustrative uses of these esters include inert heat exchange fluids, as polymerizable monomers, textile treatment, surface active agents, and the like.

3,668,234

BIS-HALOPHENOXYACETIC ACID ESTERS OF POLYALKANOLS

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Original application Oct. 22, 1968, Ser. No. 769,725, now Patent No. 3,542,795, which is a continuation-in-part of application Ser. No. 748,234, July 29, 1968, now abandoned. Divided and this application July 13, 1970, Ser. No. 61,033

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 G 4 Claims

The compounds are esters of derivatives of acetic acid and contain a plurality of bis-(p-halophenoxy)acetoxy functions, e.g., the bis-p-chlorophenoxyacetic acid ester of ethylene glycol, and are useful as hypocholestermic agents.

3,668,235

PROCESS FOR DRYING BIS-(β-HYDROXYETHYL) TEREPHTHALATE

Yataro Ichikawa; Gentaro Yamashita; Michiyuki Tokashiki, and Nobuo Suzuki, all of Iwakuni-shi, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 24, 1969, Ser. No. 888,082

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 PR 5 Claims

Process for removing a volatile liquid medium from solid bis-(β-hydroxyethyl) terephthalate wetted with said volatile liquid, by heating said wet bis-(β-hydroxyethyl) terephthalate into a molten mass and evaporating said liquid medium. Dried bis-(β-hydroxyethyl) terephthalate containing an extremely small amount of volatile liquid can be obtained in a short time without causing degradation in the quality of the product.

3,668,236

REACTION PRODUCT OF ALKANOLAMINE AND TWO PARTICULAR ACIDS

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 720,339, Apr. 10, 1968, Continuation-in-part of application Ser. No. 329,979, Dec. 12, 1963, now abandoned. This application Mar. 23, 1970, Ser. No. 22,010

Int. Cl. C07c *93/16*

U.S. Cl. 260—485 H 20 Claims

Reaction product formed by the condensation of alkanolamine, polyhalopolyhydropolycyclicdicarboxylic acid or derivative and aliphatic substituted dicarboxylic acid. The reaction product has utility as a stabilizer against deterioration of organic substances, such as lubricants, hydrocarbon oils and plastics, as well as utility as a detergent, dispersant, extreme pressure additive, flame retardant and also possessing insecticidal properties.

3,668,237

AMINE SALTS OF PHOSPHINIC ACID ESTERS

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 493,918, Oct. 7, 1965, now abandoned. This application June 24, 1969, Ser. No. 836,133

Int. Cl. C07c *101/02*

U.S. Cl. 260—485 G 9 Claims

Tertiary amine salts of polycarboxylic acid esters of bis-(hydroxyalkyl)-phosphinic acid. These compounds are useful as additives for lubricating oil, grease and organic substances normally subject to oxidative deterioration and, also serving to prevent wear or corrosion of metallic components.

3,668,238

2-HYDROXY-3-METHOXY-5-ALLYL BENZAMIDES

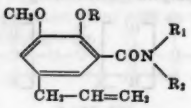
Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Continuation-in-part of application Ser. No. 743,576, June 6, 1968, now abandoned. This application Sept. 25, 1968, Ser. No. 762,606

Int. Cl. C07c *69/02*

U.S. Cl. 260—488 14 Claims

An amide of 2-hydroxy-3-methoxy-5-allyl-benzoic acid of the formula



(I)

wherein R is selected from the group consisting of hydrogen, alkyl of one to seven carbon atoms and acyl of an organic carboxylic acid of one to 18 carbon atoms, R_1 and R_2 are selected from the group consisting of hydrogen, substituted and unsubstituted alkyl of one to seven carbon atoms, aryl and cycloalkyl and when taken together with the nitrogen atom form a heterocyclic which may contain another heteroatom, which products possess outstanding choleretic properties far superior to dehydrocholic acid. The invention also relates to a novel process and novel intermediate for the preparation of the said benzamides of Formula I.

3,668,239

PROCESS FOR PREPARING GLYCOL ESTERS FROM OLEFINICALLY UNSATURATED COMPOUNDS

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc.

Continuation-in-part of application Ser. No. 763,001, Sept. 26, 1968, and 762,978, Sept. 26, 1968, and 819,507, Mar. 24, 1969. This application Apr. 23, 1970, Ser. No. 31,262

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 R 11 Claims

Glycol esters derived from olefinically unsaturated compounds are prepared by contacting the olefinically unsaturated compound and molecular oxygen in a carboxylic acid medium in the presence of a catalyst. The particular catalyst employed is a combination of tellurium and an appropriate form of bromine which will insure that the pH of the reaction medium when determined at 25° C. is maintained at less than 2.0, after a 10:1 weight dilution with water. Improved selectivities to the vicinal glycol diester are obtained when operating within the specified reaction conditions.

3,668,240

UNSATURATED ZWITTERIONIC SURFACE ACTIVE COMPOUNDS

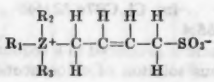
Melvin A. Barbera, Mount Healthy, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1970, Ser. No. 24,330

Int. Cl. C07c *143/16*

U.S. Cl. 260—501.12 4 Claims

Zwitterionic surface active compounds are provided having the following formula:



wherein R_1 represents an unsaturated or saturated aliphatic group having six to 24 carbon atoms, R_2 and R_3 each represent an alkyl group having one to six carbon atoms, and Z represents nitrogen or phosphorus.

These compounds have valuable surface active properties that make them especially useful as detergent compounds.

3,668,241

SUBSTITUTED 1-OXOINDEN-5-YLOXY ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, Pa., and Otto W. Wolterserf, Jr., Chalfont, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 25, 1968, Ser. No. 778,819
Int. Cl. C07c *65/02*
U.S. Cl. 260—520 8 Claims

(1-Oxoinden-5-yloxy)- and (1-Oxoinden-5-ylthio)-alkanoic acid products and salts, esters and amide derivatives thereof wherein the 1-oxoindenyl ring may be substituted by various radicals are disclosed. The said products are diuretic and saluretic agents. The products may be prepared by three routes: (1) via the dehydrohalogenation of a [1-oxo-2-halo-5-indanyloxy(or thio)]-alkanoic acid; (2) via the etherification of a 5-hydroxy-(or mercapto)inden-1-one; or (3) via the hydrolysis of a [1-oxoinden-5-yloxy-(or thio)]alkanoic acid ester.

3,668,242

HALOGENATED PHENOXY COMPOUNDS

Edward D. Weil, Yonkers, and Jerome Linder, Westfield, both of N.J., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Original application Dec. 2, 1966, Ser. No. 635,929, now Patent No. 3,443,016, dated May 6, 1969, which is a division of application Ser. No. 233,873, Oct. 29, 1962, now Patent No. 3,347,929, dated Oct. 17, 1967. Divided and this application May 1, 1969, Ser. No. 821,106
Int. Cl. C07c *65/02*
U.S. Cl. 260—521 A 6 Claims

Unsaturated halogenated phenoxy compounds are described. They are prepared by opening the corresponding halogenated phenoxy cycopentenones and are employed as herbicides.

3,668,243

DIFUNCTIONALLY TERMINATED POLYMERS AND METHODS OF THEIR PREPARATION

Edwin J. Quinn, Lancaster, Pa., assignor to Uniroyal, Inc., New York, N.Y.

Filed Aug. 9, 1968, Ser. No. 751,350
Int. Cl. C07c *59/18*
U.S. Cl. 260—535 R 6 Claims

Preparation of carboxy-hydroxy conjugated diolefin polymers useful in rocket fuel and for the production of alpha-omega dicarboxy conjugated diolefins.

3,668,244

OXIDATION OF 2-(2,4-DICHLOROPHENOXY) ETHANOL AND 2-(2,4,5-TRICHLOROPHENOXY) ETHANOL WITH NITRIC ACID TO THE CORRESPONDING PHENOXYACETIC ACID

Edwin J. Strojny, and Ludo K. Frevel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 30, 1969, Ser. No. 862,511
Int. Cl. C07c *65/02*
U.S. Cl. 260—521 A 10 Claims

Nitric acid is used to oxidize 2-(2,4-dichlorophenoxy)ethanol or 2-(2,4,5-trichlorophenoxy)ethanol to the corresponding phenoxyacetic acid by reaction with nitric acid at a temperature of 0° to 90° C. in a solvent having at least 0.5/1 parts by weight of benzenesulfonic acid to water plus sufficient sulfuric acid to maintain the total acid concentration of the reaction mixture between about 6 N and about 13 N throughout the reaction. The reaction is preferably conducted in an atmosphere of nitric oxide.

3,668,245

PROCESS FOR PREPARING ACRYLIC ACID

Howard S. Young; George C. Anderson, and Edgar L. McDaniel, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1969, Ser. No. 813,354
Int. Cl. C07c *51/32*
U.S. Cl. 260—533 N 17 Claims

Process for the oxidative conversion of propylene to acrylic acid which comprises contacting a mixture of vaporized propylene and oxygen at a temperature from about 300° C. to about 500° C. with a novel catalyst comprising oxidized molybdenum and at least one of oxidized niobium and oxidized tantalum. The novel catalyst may further include oxidized arsenic. Acrylic acid may be subsequently converted to lower alkyl esters for use in the plastics industry.

3,668,246

PROCESS FOR THE CONTINUOUS PRODUCTION OF ALKALI METAL SALTS OF NITRILOTRIACETIC ACID

Christoph Berding, Limburgerhof, Upper Palatinate; Paul Guenthert, Iggelheim, Upper Palatinate; Waldemar Koehler, and Gerhard Schulz, both of Ludwigshafen, Rhineland, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhineland, Germany

Filed Aug. 12, 1968, Ser. No. 752,033
Claims priority, application Germany, Aug. 16, 1967, P 16 43 238.5
Int. Cl. C07c *101/20*
U.S. Cl. 260—534 E 6 Claims

Continuous production of alkali metal salts of nitrilotriacetic acid from an alkali metal cyanide, formaldehyde and ammonia by reaction of the components in at least two stages, the alkali metal cyanide being reacted with formaldehyde in stoichiometric or substantially stoichiometric ratio at temperatures of 50° to 200° and pressures of from atmospheric pressure to 50 atmospheres gauge in the presence of an excess of ammonia in the first stage and (while simultaneously removing ammonia) further amounts of alkali metal cyanide and formaldehyde being allowed to act at temperatures of 60° to 110°C in one or more subsequent stages, 5 to 35 mole percent of the total amount of alkali metal cyanide required being replaced by free hydrocyanic acid and/or hydroxyacetonitrile.

3,668,247

AROMATIC ACID CHLORIDE PROCESS

Christian S. Rondestvedt, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 10, 1969, Ser. No. 875,543
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 M 9 Claims

Process for preparing benzene carbonyl chlorides useful as intermediates for making polyester, polyamide and the like condensation polymers by (1) mixing a trichloromethyl benzene bearing at least one additional halogen, trichloromethyl or carbonyl chloride group, all carbon-containing groups being nonadjacent to each other, with at least about two molecules of sulfur trioxide per trichloromethyl group; and (2) maintaining the mixture at a temperature at which it is molten but below which ring sulfonation occurs for a time sufficient to convert at least one trichloromethyl group to a carbonyl chloride group.

3,668,248

5-CHLORO-2,4-BIS(SULFAMOYL)FLUOROBENZENE AND 5-CHLORO-2,4-BIS(CHLOROSULFONYL)FLUOROBENZENE

Calvert W. Whitehead, and John J. Traverso, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original application Sept. 30, 1964, Ser. No. 400,470, now Patent No. 3,419,552, dated Dec. 31, 1968, Continuation-in-part of application Ser. No. 102,385, Apr. 12, 1961, now abandoned. Divided and this application Oct. 24, 1968, Ser. No. 810,409

Int. Cl. C07c *143/70*, *143/78*

U.S. Cl. 260—543 R 2 Claims

5-Chloro-2,4-bis(sulfamoyl)fluorobenzene, and 5-chloro-2,4-bis(chlorosulfonyl)fluorobenzene are intermediates in the preparation of dihydrobenzothiadiazine-1,1-dioxides, useful as diuretics.

3,668,249

CYCLIC HYDROCARBOXYLATION PROCESS FOR PRODUCTION OF STRAIGHT-CHAIN ACIDS, ANHYDRIDES OR ESTERS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed June 10, 1969, Ser. No. 831,982

Int. Cl. C07c *51/14*, *51/56*, *67/00*

U.S. Cl. 260—546 8 Claims

A process for preparation of straight-chain acids, anhydrides or esters, comprising contacting an ethylenically unsaturated hydrocarbon, carbon monoxide and water, a carboxylic acid or an alcohol at specified temperatures with a group VIII noble metal catalyst, separating the straight-chain product and recycling the branched-chain product to the reaction medium.

3,668,250

UREA SYNTHESIS PROCESS

Maxim Karafian, Cold Spring Harbor, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,327

Int. Cl. C07c *127/04*

U.S. Cl. 260—555 A 13 Claims

Aqueous urea solution formed by synthesis from ammonia and carbon dioxide is heated for water vapor evaporation and concentration by indirect heat exchange with a reacting mixture of off-gas and aqueous absorbent solution, which generates heat due to re-absorption of off-gas components in the aqueous absorbent solution.

3,668,251

DIALKYLAMINOALKYL AMIDES OF 6-CHLORO-1,2,3,4-TETRAHYDRO-1-NAPHTHALENEACETIC ACID AND Δ^1 ANALOGS

Robert W. Hamilton, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 22, 1969, Ser. No. 860,050

Int. Cl. C07c *103/20*

U.S. Cl. 260—558 R 4 Claims

Preparation of the captioned compounds — for example, 6-chloro-N-(2-diethylaminoethyl)-1,2,3,4-tetrahydro-1-naphthaleneacetamide, 2-dimethylaminoethyl 6-chloro-1,2,3,4-tetrahydro-1-naphthaleneacetate hydrochloride, etc. — and their valuable biological properties — including antiulcerogenic, antibiotic, and antiinflammatory activities — are disclosed.

3,668,252

SOLVENT PROCESS FOR AURAMINE AND ETHYL AURAMINE

Rill Lewis Grosklos, Williamstown, W. Va., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 22, 1968, Ser. No. 778,302

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 R 4 Claims

The process for the preparation of auramine and ethyl auramine by the reaction of 4,4'-tetramethyldiaminodiphenyl methane and 4,4'-tetraethyldiaminodiphenyl methane, respectively with sulfur, ammonium chloride and ammonia gas is improved by carrying out the reaction in the presence of a solvent selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol and glycerol at a temperature of from about 125° C. to about 175° C.

3,668,253

N-NITROSO-4,4'-BIS(2-PHENYLISOPROPYL)-DIPHENYLAMINE

Guy Bertrand, Choisy-le-Roi, and Jean Marc Maison, Paris, both of France, assignors to Rhone-Poulenc SA, Paris, France

Original application Sept. 5, 1968, Ser. No. 757,757, now Patent No. 3,573,252, dated Mar. 30, 1971. Divided and this application Sept. 9, 1970, Ser. No. 70,724

Int. Cl. C07c *87/28*

U.S. Cl. 260—570 R 1 Claim

N-Nitroso-4,4'-bis(2-phenylisopropyl)diphenylamine, a new compound, is valuable as a vulcanization retarder for elastomers. It has an anti-ageing effect on the vulcanized product.

3,668,254

N-HALOALLYL-P-PHENYLENEDIAMINES

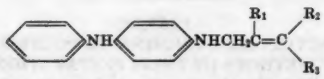
John J. D'Amico, Akron, and Sidney T. Webster, Worthington, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1970, Ser. No. 21,542

Int. Cl. C07c *87/48*

U.S. Cl. 260—576 3 Claims

A para-phenylenediamine of the formula



wherein R_1, R_2 and R_3 are hydrogen or halogen, at least one being halogen, useful for the preservation of rubber.

3,668,255

PROCESS FOR ALKYLATION OF ALIPHATIC KETONES AND PRODUCT

Walter C. Meuly, New Brunswick, and Peter S. Gradeff, Somerset, both of N.J., assignors to Rhodia Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 241,036, Nov. 29, 1962, now abandoned, and 502,585, Oct. 22, 1965, now abandoned. This application Oct. 31, 1967, Ser. No. 679,543

Int. Cl. C07c *49/06*, *49/28*, *49/30*

U.S. Cl. 260—586 R 7 Claims

A process is provided for the alkylation of aliphatic ketones having an alpha hydrogen, substitution occurring on the carbon alpha to the carbonyl group, by use of solid alkali in the presence of an organic amine and/or ammonia as a catalyst.

Alkenyl highly branched ketones having a pleasant odor also are provided, useful in the formulation of perfumes and perfume bases.

3,668,256

PURIFICATION OF ACETONE

Jasper A. Brundege, Dover, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,851
Int. Cl. C07c *49/08*
U.S. Cl. 260—593 P 6 Claims

Acetone free of aldehydic impurities is obtained by fractionally distilling crude acetone in a single, multiple-plate column and continuously introducing, at a point above the acetone feed, a counterflowing dilute alkaline solution, such as sodium hydroxide, the amount and concentration being sufficient to polymerize aldehydic impurities contained therein without forming a second liquid phase when the alkali mixes with the liquid in the column; and removing pure acetone from the top of the column and water and nonvolatiles as bottom products.

3,668,257

OXIDATION OF OLEFINS

William D. Schaeffer, Pomona, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 240,131, Nov. 26, 1962, now abandoned. This application Aug. 8, 1966, Ser. No. 570,745. The portion of the term of the patent subsequent to May 24, 1983, has been disclaimed.
Int. Cl. C07c *47/06*
U.S. Cl. 260—604 AC 11 Claims

Hydrocarbon olefins are oxidized to carbonyl compounds by contacting the olefin and oxygen with a liquid phase reaction medium containing water, a carboxylic acid and as the only catalyst components a Group VIII noble metal and an alkali metal ammonium or hydrogen chloride or bromide. The reaction proceeds at a high conversion rate despite the absence of any recognized redox agent for the Group VIII noble metal to produce acetaldehyde from ethylene, acetone from propylene and methylethyl ketone from butene.

3,668,258

SULFUR-CONTAINING POLYARYL POLYPHENOLIC COMPOUNDS AND PROCESS

Howard A. Hageman, Southbury, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed Mar. 17, 1969, Ser. No. 807,956
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F 17 Claims

The compounds are of the class of thiobis(beta-aryl-alkylene)diphenols and chain-extended polythiopoly-phenols derived therefrom. They are useful as anti-oxidants in compositions containing unsaturated rubbers — that is, so-called diene rubbers. A typical compound of the class is 4,4′-thiobis(beta-phenyl-ehtylene)diphenol, made by condensing bis(beta-chloro-phenethyl)sulfide (1 mole) with phenol (2 moles). Chain extension is apt to occur by reaction of the first-formed mono-thio diphenol with additional amounts of the dichloro coupling agent and the starting phenol, forming polythio polyphenolic compounds having repeated alternating units of the coupler and the the phenol moieties.

3,668,259

1,3,3-TRIMETHYL-BIS (α-t-BUTYLPEROXYISOPROPYL)-1-PHENYLINDANE

Frederick G. Schappell, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser No. 741,850, July 2, 1968. This application Dec. 31, 1969, Ser. No. 889,685
Int. Cl. C07c *73/06*
U.S. Cl. 260—610 B 7 Claims

1,3,3-Trimethyl-bis(α-t-butylperoxyisopropyl)-1-phenylindanes in which the α-t-butylperoxyisopropyl groups are attached in the 6- and 4′-, 6- and 3′-, 5- and 4′-, and 5- and 3′-, 7- and 4′-, or 7- and 3′-positions are heated in contact with curable polymers whereby crosslinking of the polymer is effected.

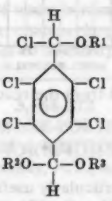
3,668,260

SUBSTITUTED TETRACHLOROBENZENES

Friedrich Becke, Heidelberg; Adolf Fischer, Mutterstadt; Helmut Hagen, and Guenter Scheuerer, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed May 8, 1970, Ser. No. 35,877
Claims priority, application Germany, May 14, 1969, P 19 24 530.8
Int. Cl. C07c *43/28*
U.S. Cl. 260—611 A 2 Claims

New and valuable substituted thetrachloro-benzenes having the formula



where R^1, R^2 and R^3 are identical or different and each denotes an alkyl radical, herbicides containing these compounds, and a process for controlling the growth of unwanted plants with these compounds.

3,668,261

NITRATION PROCESS FOR PHENOLIC COMPOUNDS

Ernest Albert Harvey, Beaver Falls, N.Y., and James Frederick Russ, North Brunswick, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Original application Nov. 24, 1965, Ser. No. 509,629, now Patent No. 3,519,693, dated July 7, 1970. Divided and this application Dec. 17, 1969, Ser. No. 886,040
Int. Cl. C07c *79/24*
U.S. Cl. 260—622 R 2 Claims

A phenolic compound, selected from phenol and m-cresol is nitrated to produce a high yield of paranitrated phenolic compound by a process comprising (1) providing a mixed acid solution having defined concentrations of HNO_3, HNO_2 and H_2SO_4, (2) adding the phenolic compound to said solution in a manner to avoid formation of an oil-phase therein while maintaining the temperature of the solution at from −20° to +25° C., the amount of phenolic compound added not exceeding 5 moles per liter of the acid solution and the concentration of HNO_2 in said solution always being 1 mole per liter in excess of the phenolic compound added, and (3) recovering the paranitrated phenolic compound product from the reaction mixture.

3,668,262

HIGH DENSITY FLUOROBROMOALKANES FOR GYROSCOPE FLOTATION

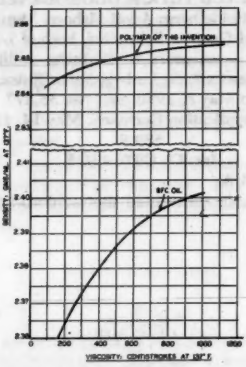
Albert L. Dittman, Hackensack, N.J., assignor to Halocarbon Products Corporation

Filed Sept. 8, 1969, Ser. No. 855,999
Int. Cl. C07c *19/08*; C08f *3/20*
U.S. Cl. 260—653.1 T 5 Claims

Totally substituted fluoro-bromo hydrocarbons useful as gyroscopic damping and flotation oils are obtained by react-

ing tetrabromomethane with bromotrifluoroethylene or tribromofluoromethane with bromotrifluoroethylene in the presence of ultraviolet radiation.

Normal tetrabromotetrafluoropropane and normal pentabromoheptafluoropentane are specifically claimed.



A polymer separated from the reaction products and having the formula:

$$CFBr_2(CF_2CFBr)_nCF_2CFBr_2$$

where $n = 3$ to 10 is particularly useful as a gyroscopic flotation oil because it has a rather high density which changes very little with the molecular weight of the polymer.

3,668,263

ORGANOLITHIUM POLYMERIZATION INITIATORS AND USE THEREOF IN POLYMERIZATION PROCESSES

Robert C. Morrison, and Conrad W. Kamienski, both of Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Filed Jan. 19, 1970, Ser. No. 4,126

Int. Cl. C07f *1/02*; C08d *3/04*

U.S. Cl. 260—665 R **24 Claims**

Polymerization initiator compositions comprising reaction products of C_2–C_{12} alkyllithiums with monomers from the group of polymerizable conjugated dienes and polymerizable vinyl-substituted aromatic compounds in a medium of aliphatic, cycloaliphatic or aromatic hydrocarbons and/or aliphatic tertiary monoamines or aryl ethers, the conjugated diene and vinyl-substituted aromatic compound portion of said initiator compositions being relatively nonpolymeric. Such initiator compositions are highly effective for the productions of polymers of conjugated dienes and/or vinyl-substituted aromatic compounds.

3,668,264

PRODUCTION OF ALKYLBENZENES

Starling K. Alley, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed July 15, 1969, Ser. No. 842,007

Int. Cl. C07c *3/52*

U.S. Cl. 260—671 **15 Claims**

Alkyl benzenes are produced from a cycloalkane, benzene or an alkylbenzene having a lower degree of alkylation by contacting the feedstock with a zeolitic composition of alumina and silica in the absence of any hydrogenating component and at a temperature from about 400° to 700° F. The contacting is performed at a space velocity from about 1 to about 10 liquid volumes per volume per hour and a pressure from about 1 to 100 atmospheres in the absence or presence of hydrogen. It is believed that the contacting under the aforedescribed conditions dehydrogenates the cycloalkanes and fragments some of the aromatic rings. The resulting fragments are active in alkylating remaining aromatic rings to thereby increase the degree of alkylation of the feedstock.

3,668,265

DISPROPORTIONATION OF ALKYLBENZENES

Donald C. Tabler, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Jan. 14, 1970, Ser. No. 2,971

Int. Cl. C07c *3/62*

U.S. Cl. 260—672 T **11 Claims**

Disproportionation of alkylbenzenes is promoted by the use of catalysts prepared from antimony salts, optionally with cobalt or nickel salts, on alumina.

3,668,266

SODIUM MORDENITE SEPARATION OF PARA-XYLENE

Nai Yuen Chen, Cherry Hill, and Stanley J. Lucki, Runnemede, both of N.J., assignors to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 340,789, Jan. 28, 1964, now abandoned , which is a division of application Ser. No. 838,023, June 19, 1969, now Patent No. 3,524,895, dated Aug. 18, 1970. This application Nov. 26, 1969, Ser. No. 877,577

Int. Cl. C07c *7/00*

U.S. Cl. 260—674 **1 Claim**

An improved separation of para-xylene from a mixture of para-meta-xylene is achieved by passing the mixture through an adsorption zone of aluminosilicate with a crystalline structure of sodium mordenite for a relatively short adsorption period. The para-xylene is preferentially sorbed.

3,668,267

SEPARATION OF 2,7-DIMETHYLNAPHTHALENE FROM 2,6-DIMETHYLNAPHTHALENE WITH MOLECULAR SIEVES

John A. Hedge, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Jan. 30, 1970, Ser. No. 7,273

Int. Cl. C07c *7/12*

U.S. Cl. 260—674 SA **16 Claims**

Two structurally similar polycyclic compounds can be separated by contacting a fluid feed mixture containing said compounds with a partially dehydrated molecular sieve zeolite, the ratio Al/Si of the zeolite being in the range of 0.65–0.2. The polycyclic compounds can be heterocyclic or carbocyclic. For example, selective adsorption of 2,7-dimethylnaphthalene from a dimethylnaphthalene concentrate is obtained with sodium Type Y molecular sieves. 2,6-Dimethylnaphthalene can then be crystallized from the unadsorbed raffinate fraction. Separation factors of 6 to 8 are obtained, indicating the unexpected high selectivity of these particular molecular sieves for this adsorption (especially compared to Type X zeolite).

A continuous method is disclosed for adsorption and desorption of 2,7-dimethylnaphthalene utilizing Type Y zeolite. Type L zeolite can be used for adsorption and desorption of 2,6-DMN.

3,668,268

PARAFFIN CONVERSION

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 17, 1970, Ser. No. 29,701

Int. Cl. C07c *9/00*

U.S. Cl. 260—676 **8 Claims**

A process for disproportionating feed light alkane to obtain higher molecular weight hydrocarbons which comprises contacting the feed light alkane, at elevated temperature and pressure, with a catalyst comprising a molecular sieve composited with a Group VIII noble metal. Preferably the contacting is carried out in the presence of H_2O.

3,668,269

PROCESS FOR DISPROPORTIONATING PARAFFINIC HYDROCARBONS TO YIELD PRODUCTS CONTAINING ISO-PARAFFINIC HYDROCARBONS

Frank J. Chloupek, South Holland, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed June 26, 1970, Ser. No. 50,330
Int. Cl. C07c 9/00
U.S. Cl. 260—676 R 13 Claims

A process for disproportionating paraffinic hydrocarbons containing three to seven, four to five, carbon atoms in a hydrogen atmosphere to yield products containing iso-paraffinic hydrocarbons containing one more and hydrocarbons containing one less carbon fragment per molecule is disclosed. In the process, the paraffinic hydrocarbon is contacted in a hydrogen atmosphere at about 700° to 900° F. with a solid, acidic catalyst comprising a minor, catalytically effective amount of a platinum-group metal and containing a hydrogen or metal exchanged crystalline aluminosilicate having pores in the 8 to 15 A range and a mole ratio of silica-to-alumina of greater than about 2 to 1 and a solid oxide support. The catalyst can contain from about 1 up to about 85 weight percent of the crystalline aluminosilicate. A preferred oxide support is silica-alumina which can further contain a minor amount of alumina such as an activated alumina of the gamma family.

3,668,270

OLEFIN PURIFICATION PROCESS

David Eric Martin, Camberley, and Brian Michael Palmer, Shepperton, both of England, assignors to BP Chemicals Limited, London, England

Filed June 18, 1970, Ser. No. 47,350
Claims priority, application Great Britain, July 17, 1969, 35,982/69
Int. Cl. C07c 11/12
U.S. Cl. 260—683 D 9 Claims

A process for the purification of an olefinic feedstock, particularly a feedstock for a disproportionation process over a rhenium heptoxide supported on alumina catalyst, by contacting the feedstock with a catalyst consisting essentially of a supported alkali metal at a temperature in the range −50° to +80° C and a pressure in the range 0 to 2,000 psig. and a Liquid Hourly Space Velocity in the range 0.01 to 100.

3,668,271

HYDROGENATION OF UNSATURATED HYDROCARBONS USING ION EXCHANGE RESIN CONTAINING ZERO-VALENT METAL AS CATALYST

Werner O. Haag, Trenton, and Darrel Duayne Whitehurst, Raritan, both of N.J., assignors to Mobil Oil Corporation

Original application Oct. 2, 1967, Ser. No. 672,007, now Patent No. 3,578,609, dated May 11, 1971. Divided and this application Mar. 13, 1970, Ser. No. 48,580
Int. Cl. C07c 5/08
U.S. Cl. 260—683.9 1 Claim

This specification discloses hydrogenation of unsaturated hydrocarbons. As catalyst for these reactions, an ion exchange resin containing zero-valent metal is employed. In the preparation of the catalyst, an ion exchange resin is contacted with a reducing agent to fix the reducing agent in the resin. Thereafter, the resin is contacted with a soluble metal compound, the metal being from Groups VIII, IB, IIB, IIIB, IVB, VB, VIB, and VIIB of the Periodic Table. The metal of the compound is thereby reduced to the zero-valent state in situ in the resin.

3,668,272

UNSATURATED ETHERS OF POLYALKOXY SILANES AND THERMOSETTING SYSTEMS CONTAINING COPOLYMERS THEREOF

Kazys Sekmakas, Chicago, Ill., assignor to De Soto, Inc., Chicago, Ill.

Continuation of application Ser. No. 519,524, Jan. 10, 1966, now abandoned. This application June 22, 1970, Ser. No. 48,958. The portion of the term of the patent subsequent to Sept. 23, 1986, has been disclaimed.
Int. Cl. C08f 11/04, 35/06; C08g 47/10
U.S. Cl. 260—826 14 Claims

Solvent-soluble, heat-hardening, non-gelled resins are provided by etherifying a polymethoxy siloxane with an unsaturated hydroxy-functional compound, with some of the methoxy groups of the siloxane being preserved for subsequent cure. This ether is then copolymerized with other ethylenically unsaturated materials to form a copolymer which includes methoxy groups carried by the siloxane in order to improve the elevated temperature cure of the resin. The preparation of an unsaturated ether by a reaction in which alcohol instead of water is removed coupled with subsequent polymerization enables larger proportions of the resinous siloxane material to be incorporated into the resin.

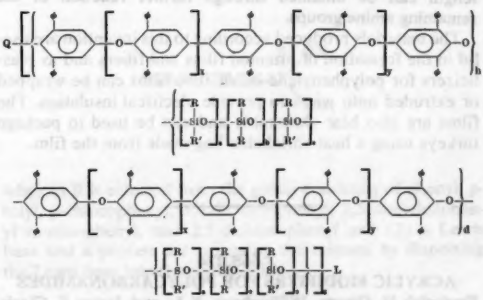
3,668,273

ORGANOPOLYSILOXANE-POLYPHENYLENE OXIDE BLOCK COPOLYMERS & METHOD OF PREPARATION

Karl W. Krantz, Schenectady, N.Y., assignor to General Electric Company

Filed Mar. 5, 1971, Ser. No. 121,518
Int. Cl. C08g 47/10, 43/02, 23/16
U.S. Cl. 260—824 R 15 Claims

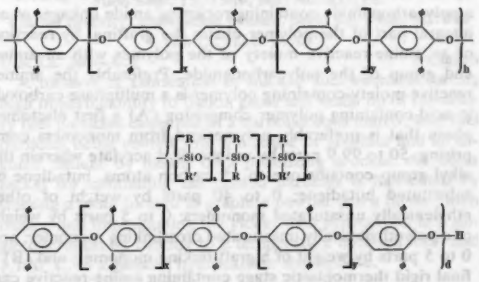
Novel block copolymers are provided having both polydiorganosiloxane segments and polyphenylene oxide segments. The block copolymers are selected from those having the formula:



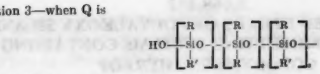
where Q and L are chosen from the group consisting of:

Option 1—when Q is a single bond, L is a single bond forming a cyclic or infinite polymer;

Option 2—when Q is HO, then L is:

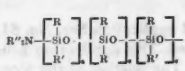


Option 3—when Q is



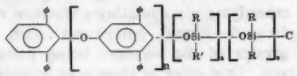
then L is H

Option 4—when Q is

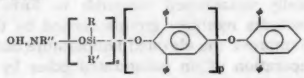


then L is

and those having the formula:



where C is chosen from:



where R is one of a variety of organic substituents, R′ is a nonphenyl substituent; each R″ is independently selected from the class consisting of hydrogen, lower alkyl radicals having from one to six carbon atoms, and aryl radicals; ϕ is the phenyl substituent; *a*, *b*, *c*, and *e* are representative of the chain length of the polydiorganosiloxane components; *n*, *p*, *x*, and *y* are representative of the length *of* of polyphenylene oxide components; and *d*, *f*, *g* and *h* are indicative of the number of recurring units in the block copolymer, and each *a*, *b*, *c*, *e*, *n*, *p*, *x*, *y*, *d*, *f*, *g* and *h* are independent of each other, for example, the value of *a* in a polysiloxane block of a particular polymer can be different from the value of a second *a* in the same polymer.

The block copolymers are formed by reacting polyphenylene oxide segments with polydiorganosiloxane segments which are chain terminated with amine groups. Additional length can be obtained through further reaction of the remaining amine groups.

The materials produced according to this invention are useful in the formation of oriented films and fibers and as plasticizers for polyphenylene oxide. The films can be wrapped or extruded onto wires to provide electrical insulation. The films are also heat shrinkable and can be used to package turkeys using a heat shrinkable bag made from the film.

3,668,274

ACRYLIC MODIFIERS FOR POLYCARBONAMIDES

Frederick H. Owens, Willingboro, N.J., and James S. Clovis, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sept. 10, 1970, Ser. No. 71,228

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 G **12 Claims**

An impact resistant nitrogenous polymer comprises a multiphase amine-reactive moiety-containing polymer grafted to a polycarbonamide containing recurring amide linkages as an integral part of the polymer chain; the grafting, by reaction of an amine-reactive moiety of the polymer with an amine end group of the polycarbonamide. Preferably the amine-reactive moiety-containing polymer is a multiphase carboxylic acid-containing polymer comprising (A) a first elastomer phase that is preferably polymerized from monomers comprising; 50 to 99.9 parts by weight alkyl acrylate wherein the alkyl group contains one to 15 carbon atoms, butadiene or substituted butadiene; 0 to 40 parts by weight of other ethylenically unsaturated monomers; 0 to 5 parts by weight of a polyethylenically unsaturated crosslinking monomer; and 0 to 5 parts by weight of a graft-linking monomer; and (B) a final rigid thermoplastic stage containing amine-reactive carboxylic acid groups and polymerized from monomers containing; 1 to 50 parts by weight of a copolymerizable carboxylic acid; 50 to 99 parts by weight of a member selected from the group consisting of alkyl methacrylates, styrenes, acrylonitrile methacrylonitrile and olefins that, when homopolymerized, form polymers having a heat distortion temperature greater than about 20° C.; 0 to 49 parts by weight of another acrylic monomer; and 0 to 40 parts of another copolymerizable ethylenically unsaturated monomer. The impact resistance nitrogenous polymer is characterized by superior hot strength that renders the polymer extrudable, blow moldable and injection moldable.

3,668,275

COATING COMPOSITIONS COMPRISING A POLYESTER FROM 1,4-BIS(HYDROXYMETHYL) CYCLOHEXANE

Franz Riemhofer; Walter Dittmann; Karl-Heinz Hornung, and Ernst-Christian Schutze, all of Marl, Germany, assignors to Chemische Werke Huels A.G., Marl, Germany

Continuation of application Ser. No. 749,348, Aug. 1, 1968, now abandoned. This application Aug. 12, 1970, Ser. No. 63,300

Claims priority, application Germany, Aug. 10, 1967, C 43 079; Feb. 6, 1968, C 44 550

Int. Cl. C08g *37/34*; C07c *69/34*

U.S. Cl. 260—850 **13 Claims**

Coatings having high elasticity and hardness as well as excellent resistance to chemicals from cured compositions of:

(a) aminoplast and

(b) linear polyesters

of a molecular weight of 600 – 3,000 made from 1,4-bis-(hydroxymethyl)-cyclohexane optionally with minor amounts of other diols, and a mixture of (1) 91–33 mol percent aliphatic dicarboxylic acid, and (2) 9–67 mol percent aromatic and/or cycloaliphatic diacarboxylic acid, functional esterifiable acid derivatives of such acids also being usable.

3,668,276

COATING COMPOSITIONS COMPRISING AMINOPLASTS AND POLYESTER BLENDS

Franz Riemhofer; Walter Dittmann; Uwe Blethan; Karl-Heinz Hornung, and Ernst-Christian Schutze, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 23, 1969, Ser. No. 868,901

Claims priority, application Germany, Oct. 25, 1968, P 18 05 189.3; P 18 05 196.2

Int. Cl. C08q *37/34*

U.S. Cl. 260—850 **18 Claims**

Coating compositions resistant to yellowing, solvents, acids and alkalies and having the combination of high elasticity and good hardness are produced by using a mixture of

a. an aminoplast and

b. a polyester having an average molecular weight of 800–5,000 of (I) an alcohol mixture which contains an aliphatic polyol having three to four hydroxyl groups and three to six carbon atoms and a diol which includes 1,4-bis(hydroxymethyl)-cyclohexane, and (II) an acid mixture of one or more cyclic dicarboxylic acids and one or more acyclic dicarboxylic acids or functional acid derivatives thereof.

3,668,277

COATING COMPOSITIONS COMPRISING A MIXTURE OF A POLYESTER AND AMINOPLAST

Franz Riemhofer; Walter Dittmann; Uwe Bethlan; Karl-Heinz Hornung, and Ernst-Christian Schutze, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 23, 1969, Ser. No. 868,926

Claims priority, application Germany, Oct. 25, 1968, P 18 05 190.6

Int. Cl. C08g *37/34*

U.S. Cl. 260—850 **16 Claims**

Coating compositions resistant to yellowing, solvents, acids

and alkalies having the combination of a high elasticity and good hardness are produced by using a mixture of

a. an aminoplast and

b. a polyester having an average molecular weight of between 600 and 3,000 of

I. an alcohol mixture which contains 1,4-bis(hydroxymethyl)cyclohexane and another aliphatic or cycloaliphatic diol, and

II. an acid mixture of one or more cyclic dicarboxylic acids and one or more acyclic dicarboxylic acids or functional acid derivatives thereof.

3,668,278

BLENDS OF POLYOLEFINS AND POLYAMIDES

Alberto Bonvicini, Terni, and Giuseppe Cantatore, Collescipoli, both of Italy, assignors to Montecatini Edison S.P.A., Milan, Italy

Filed Sept. 29, 1970, Ser. No. 76,646

Claims priority, application Italy, Oct. 1, 1969, 22766 A/69

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 L **4 Claims**

A new class of basic polyamides having a molecular weight between about 2,000 and 200,000. The polyamides are prepared by first reacting an acrylic or methacrylic ester with a monoamine and then further reacting the product obtainable with a polyamine. The polyamides are suitable for use as tinctorial modifiers for polymeric materials and particularly for crystalline polyolefins consisting essentially of isotactic macromolecules.

3,668,279

PROCESS FOR COUPLING LIVING LITHIOPOLYMERS

Frederick C. Loveless, Oakland, and Roy E. Hartz, Jefferson, both of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 885,301, Dec. 15, 1969, now abandoned. This application July 6, 1970, Ser. No. 52,743

Int. Cl. C08f *15/00*, *7/02*; C08d *5/00*

U.S. Cl. 260—879 **12 Claims**

Living monolithio polymers are coupled by the action of certain novel coupling agents (e.g., nitrobenzene, sulfur, dimethyl terephthalate, acrylonitrile, maleic anhydride). For example, styrene is first polymerized in benzene with n-butyl lithium catalyst to form a styrene polymer block (S) followed by addition of butadiene to form a butadiene polymer block (B) copolymerized with the styrene block in the form of a living monolithio block copolymer $SB^{\ominus}Li^{\oplus}$. Then a coupling agent, such as nitrobenzene, is added, forming coupled block copolymer SBCSB where C is a residue of the coupling agent. Coupling of three molecules of living polymer is possible with maleic anhydride, or of four molecules with dimethyl terephthalate.

3,668,280

DYE-RECEPTIVE POLYOLEFIN TEXTILE FIBERS COMPRISING SYNTHETIC HIGH POLYMERS, AND PROCESS FOR THEIR PREPARATION

Alberto Bonvicini, and Giuseppe Cantatore, both of Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Feb. 24, 1970, Ser. No. 13,811

Claims priority, application Italy, Feb. 26, 1969, 13.333 A/69

Int. Cl. C08f *21/12*

U.S. Cl. 260—897 B **20 Claims**

There are disclosed dyeable fibers comprising mixtures of olefinic polymers with terpolymers of (a) vinyl or isopropenyl derivatives of aromatic hydrocarbons, such as styrene, vinyl-toluene, alpha-methylstyrene and the like; (b) alpha, beta-unsaturated nitriles, such as acrylonitrile, methacrylonitrile, and the like; and (c) aromatic and cycloaliphatic hydrocarbons, containing a double vinylenic bond, such as indene, acenanaphthylene, cyclohexene, and the like. The olefin polymer may be, and preferably is, a high molecular weight polypropylene consisting essentially of isotactic polypropylene made up of isotactic macromolecules, i.e., of macromolecules having substantially isotactic structure and being non-extractable with boiling n-heptane. A process for preparing the dye-receptive fibers is also disclosed.

3,668,281

POLYPROPYLENE COMPOSITIONS

William O. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 25, 1970, Ser. No. 14,194

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 C **8 Claims**

High impact strength polypropylene compositions are prepared by blending polypropylene, a halogenated polyolefin, and a rubbery ethylene-propylene copolymer. These compositions can be made fire-resistant by blending therein a halogenated bis(cycloalkenyl) compound, optionally further with antimony oxide, without loss of desired physical properties.

3,668,282

STABILIZED MIXTURE EMPLOYING N-(BETA-0,0-DIALKYLDITHIOPHOSPHORYL) ARYL SULFONAMIDES

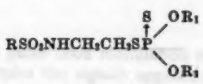
John F. Below, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation of application Ser. No. 644,815, June 9, 1967. This application May 8, 1970, Ser. No. 37,388

Int. Cl. A01n *9/36*; C07f *9/16*

U.S. Cl. 260—944 **9 Claims**

A mixture comprising (1) a N-(beta-0,0-dialkyldithiophosphoryl)-aryl sulfonamides having the formula:



wherein R is selected from the group consisting of phenyl, p-tolyl, p-chlorophenyl, 3,4-dichlorophenyl, 2,5-dimethylphenyl m-nitrophenyl, and 2,5-dichlorophenyl and (2) a Lewis base and a process for preparing the mixture by dispersing the Lewis base into the sulfonamide.

3,668,283

PROCESS FOR THE FABRICATION OF NUCLEAR FUEL ELEMENTS

Claude Moreau, Seyssinet, France, assignor to Commissariat A L'Energy Atomique, Paris, France

Filed Sept. 11, 1969, Ser. No. 857,187

Claims priority, application France, Sept. 23, 1968, 167099

Int. Cl. G21c *21/00*

U.S. Cl. 264—0.5 **9 Claims**

A method of fabrication of nuclear fuel elements having high impermeability to fission gases and made up of refractory fuel particles dispersed in a carbonaceous matrix, said fuel particles being coated with a mixture of graphite and an organic diluent by means of a pelletizing process. An outer jacket for containing the coated particles is fabricated by shaping a paste formed of graphite powder and a binder, then baking and impregnating the jacket with pyrocarbon in a single operation by heating to a temperature between 850° and 1,100° C. in a gaseous hydrocarbon atmosphere.

3,668,284

MANUFACTURE OF NUCLEAR FUEL ELEMENTS

John Richard Cox Gough, Weymouth, Dorset; Geoffrey William Meaden, Wareham, Dorset, and Michael Stuart Thomas Price, Weymouth, Dorset, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 2, 1968, Ser. No. 780,602
Claims priority, application Great Britain, Apr. 22, 1968, 18,985/68
Int. Cl. G21c *21/02*
U.S. Cl. 264—0.5 2 Claims

A method of agglomerating particles of nuclear fuel resides in tumbling the particles in a drum or other container while spraying alternately in succession powdered graphite/synthetic resin mixture and a spray of solvent for the resin wherein the proportions of graphite powder may be between 60 and 40 percent of the total powder mix.

3,668,285

WARM-PRESSING METHOD OF MAKING STACKED FUEL PLATES

C. Trench De Freitas, Sao Paulo, Brazil, and Joseph W. Handwerk, Sepulveda, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 27, 1970, Ser. No. 84,516
Int. Cl. G21c *21/02, 3/18*
U.S. Cl. 264—0.5 4 Claims

A process for rapidly fabricating large numbers of thin, flat fuel plates of uranium dioxide or uranium dioxide-plutonium dioxide for use in a nuclear reactor. Using U_3O_8 or an uranium oxide having an oxygen to metal ratio greater than 2 to 1 as starting material, a plurality of such plates are pressed simultaneously in a metallic die at 800° to 1,000° C. in a reducing atmosphere using spacers between the plates.

3,668,286

FIBERBOARD PRODUCED FROM WOOD PARTICLES HAVING A 5 TO 25 PERCENT MOISTURE CONTENT PRIOR TO STEAMING AND MECHANICAL REDUCTION IN THE FORMATION PROCESS

Stanley H. W. Brooks, and Harry A. Raddin, both of Richmond, Va., assignors to Miller Hofft, Inc., Richmond, Va.

Filed Apr. 14, 1970, Ser. No. 28,503
Int. Cl. B29j *5/02;* D21j *1/06*
U.S. Cl. 264—26 7 Claims

Fiberboard is produced by subjecting a mass of wood particles that have previously been dries to a moisture content in the range of about 5 to 25 percent to steaming and mechanical reduction to form a mass of lignocellulosic material in fibrous form; mixing the latter with a solution of the essentially unreacted ingredients of a thermosetting resin; compressing the resulting mass to desired thickness between separately heated platens; creating between said platens and throughout said mass a high frequency electric field; and maintaining said field for a time sufficient to initiate and at least partially complete the reaction of said ingredients; said solution of essentially unreacted ingredients of thermosetting resin having a viscosity under about 100 c.p.s. and a resin solids content of at least about 45 percent.

3,668,287

METHOD OF CONSTRUCTING FOAMED IN PLACE BUILDING CONTAINING HEATING WIRE

William L. Mackie, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Original application Sept. 25, 1968, Ser. No. 762,463, now Patent No. 3,503,167, dated Mar. 31, 1970. Divided and this application Dec. 29, 1969, Ser. No. 888,552
Int. Cl. B29d *27/04*
U.S. Cl. 264—46 3 Claims

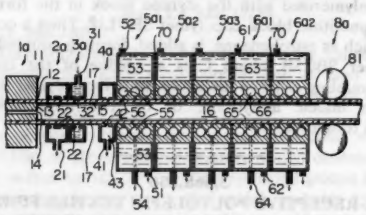
The invention is directed to a method of constructing a shelter and includes securing an inflatable form to a base element, inflating the form, applying a releasing agent to the form, positioning heating wires over the form, spraying polyurethane foam over the form, removing the form after curing said foam and then positioning a door and windows in the structure. The sprayed polyurethane foam may include an inner layer of non-interconnected cells and an outer layer of interconnected cells which permits a cooling effect when moisture is deposited on the structure.

3,668,288

METHOD FOR MAKING THERMOPLASTIC SYNTHETIC RESIN HOLLOW STRUCTURE ARTICLES

Keiichi Takahashi, 340-656-3 Nakakakubu, Ichikawa-shi, Japan

Filed July 30, 1969, Ser. No. 846,089
Claims priority, application Japan, Apr. 2, 1969, 44/24738; Nov. 18, 1968, 43/83772; Dec. 18, 1968, 43/92328
Int. Cl. B29c *17/07, 25/00;* B29d *23/04, 27/00*
U.S. Cl. 264—47 24 Claims



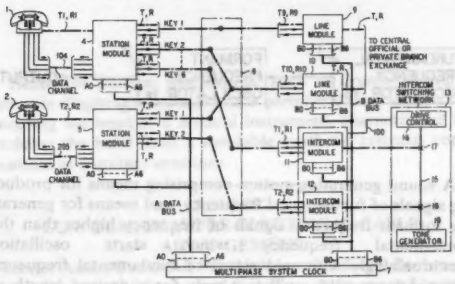
A method for continuously making hollow structures of thermoplastic synthetic resin. The resin is heated and extruded to form a continuous hollow structure. Fluid coolant is forced onto the outer surface of the structure and subsequently removed so as to provide for cooling of the outer surface of the structure without retaining stress therein due to quick cooling of the structure. The structure is then continuously shaped in an externally disposed suction mechanism while slowly cooling the structure. The structure may then be reheated to remove any residual stress.

ELECTRICAL

3,668,289
KEY TELEPHONE SYSTEM LINK SWITCHING NETWORK

Francis Michael Fenton, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 3, 1970, Ser. No. 60,505
Int. Cl. H04m *3/56*
U.S. Cl. 179—1 CN **12 Claims**

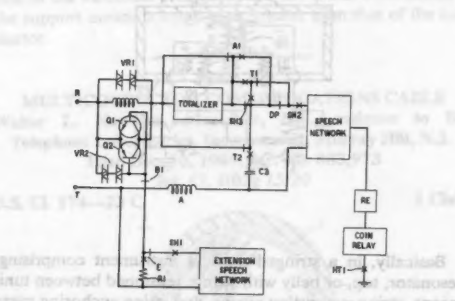


A conference link for a plurality of telephone station sets is disclosed which eliminates the need for battery feed coils by switching in a current supply transistor respective to each telephone set incident to connecting that set to the link. The current supply transistor is biased for constant current operation to provide an additional increment of constant current for each telephone set communicating over the link.

3,668,290
COMBINATION COIN TELEPHONE AND EXTENSION CIRCUIT

Ralston Hodges Robertson, Jr., Bayou La Batre, Ala., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 22, 1970, Ser. No. 57,154
Int. Cl. H04m *17/00*
U.S. Cl. 179—6.3 R **5 Claims**

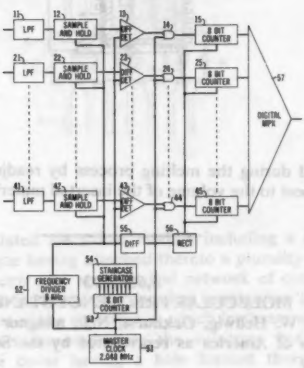


A circuit for connecting an extension telephone across the terminals of a coin telephone employs the combination of an in-line relay in parallel with a solid state switch to ensure access to the telephone line by the coin telephone irrespective of whether the extension is in use and to preclude monitoring of the coin telephone by the extension.

3,668,291
PULSE CODE MODULATION MULTIPLEX SYSTEM

Matthew Francis Slana, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 22, 1971, Ser. No. 108,791
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 AP **3 Claims**



A multichannel pulse code modulation time division multiplex system samples the signals appearing in each of the channels substantially simultaneously at a predetermined rate and encodes the signal samples obtained from all of the channels substantially simultaneously with the aid of a clock pulse generator common to all channels, a repetitive staircase waveform generator common to all channels driven by the clock pulse generator, a separate pulse counter in each channel, a gate in each channel for supplying pulses from the clock pulse generator to the pulse counter, and comparison means in each channel to inhibit transmission through the gate whenever the staircase waveform exceeds the magnitude of the signal sample in the same channel.

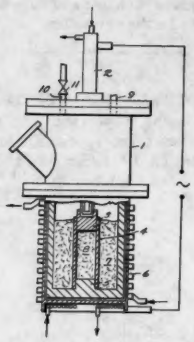
3,668,292
APPARATUS FOR VAPOR FREE MELTING OF URANIUM CARBIDE OR PLUTONIUM CARBIDE

Axel Krauth, Wurzburg, and Hans-Jurgen Teiwes, Ruckingen, both of Germany, assignors to Nukem Nuklear-Chemie and-Metallurgie GmbH, Wolfgang bei Hanau (Main), Germany

Filed July 17, 1970, Ser. No. 55,876
Int. Cl. H05b *3/60*
U.S. Cl. 13—23 **6 Claims**

There is provided an apparatus for the vapor free melting of fuel carbides consisting of uranium carbide, plutonium carbide or mixtures of these carbides. The apparatus comprises a cylindrical melting tube and two posts serving as

electrodes which form a closed reaction space. At least one electrode is moveable and the volume of the reaction space is



changed during the melting process by readjustment of the upper post to the volume of the inserted material.

3,668,293

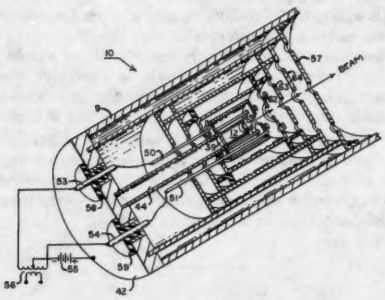
MOLECULAR FREQUENCY STANDARD

Helmut W. Hellwig, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army

Original application Apr. 16, 1968, Ser. No. 721,776, now Patent No. 3,578,968, dated May 18, 1971. Divided and this application Mar. 17, 1970, Ser. No. 24,965

Int. Cl. H05b 7/00

U.S. Cl. 13—31 5 Claims



A molecular beam source for a molecular beam tube frequency standard using a barium oxide molecule of the form $Ba^{138}O^{16}$ having spinless atoms and using electrostatic state selection, which source includes a thin-walled refractory electrically conductive oven tube containing $Ba^{138}O^{16}$. The oven tube, which is chemically inert to barium oxide, is surrounded by a thermionic electron emitter which is made negative with respect to the oven tube. Electrons emitted from the electron emitter bombard the oven tube and heat the barium oxide to a temperature at which $Ba^{138}O^{16}$ molecules are evaporated.

3,668,294

ELECTRONIC SYNTHESIS OF SOUNDS EMPLOYING FUNDAMENTAL AND FORMANT SIGNAL GENERATING MEANS

Akio Kameoka, Kawasaki; Shinichi Nakamura, Yokohama; Shinichi Makino, Fujisawa; Kenjiro Endoh, Tokyo, and Mamoru Kuriyagawa, Kamakura, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 15, 1970, Ser. No. 54,889

Claims priority, application Japan, July 16, 1969, 44/55781; Oct. 7, 1969, 44/79686; Sept. 30, 1969, 44/77535

Int. Cl. G10h 5/06

U.S. Cl. 84—1.01 13 Claims

A sound generating system comprising means for producing signals of fundamental frequency, and means for generating formant frequency signals of frequency higher than the fundamental frequency which starts oscillation synchronizingly with said signal of fundamental frequency and continues said oscillation only for a desired length of time during the period of said signals of fundamental frequency, wherein said signals of formant frequency are generated at the same starting point for each frequency interval as said signals of fundamental frequency. Sounds thus produced consist of a fundamental frequency component and harmonic components, and the frequency spectrum of said sounds presents a peak in a formant frequency, so that the system eliminates the necessity of using an electrical filter having complicated frequency characteristics in electrically producing sounds having a complicated frequency spectrum.

3,668,295

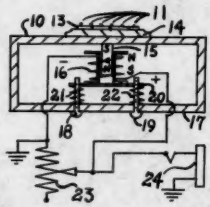
ELECTROMAGNETIC AUDIO PICKUP FOR STRINGED MUSICAL INSTRUMENTS, WITH VOLUME CONTROL MEANS, AND SUITABLE FOR USE WITH ANY TYPE STRINGS

Paul Daniel Broussard, 1009 North Hebert, Kaplan, La.

Filed Mar. 31, 1971, Ser. No. 129,878

Int. Cl. G10h 3/00

U.S. Cl. 84—1.15 10 Claims



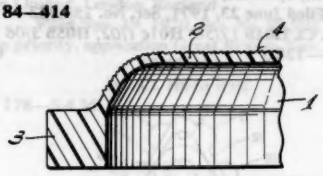
Basically, in a stringed musical instrument comprising a resonator, top, or belly with strings tensioned between tuning means, string supporting means, and string anchoring means; the improvement comprising an electromagnetic audio pickup suitable for use with any type strings. Said pickup comprises a magnet secured to the said resonator, top, or belly, and a hollow core coil which is magnetically linked to the said magnet so that the magnetic fields aid, and the said coil is mounted to the instrument back or equivalent thereof in a fixed or adjustable relationship to the magnet secured to the resonator, top, or belly.

3,668,296

HEAD FOR MUSICAL INSTRUMENT

Andrew C. Criscuolo, 8 Belleview Drive, Derby, Conn.

Filed June 8, 1970, Ser. No. 44,097
Int. Cl. G10d 13/02
U.S. Cl. 84—414 6 Claims



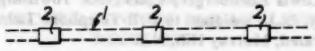
Heads for musical instruments, such as drums, having a vibratile diaphragm section and a peripheral ring section for securing the head to a musical instrument, characterized by molding the head from a moldable synthetic resinous composition as a unitary structure.

3,668,297

LOW-TEMPERATURE ELECTRICAL CABLE ARRANGEMENT

Theodor Adam Buchhold, Wiesbaden, and Eduard Bochenek, Frankfurt am Main, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 14, 1971, Ser. No. 133,826
Claims priority, application Germany, Apr. 17, 1970, P 20 18 404.7
Int. Cl. H01b 7/34, 9/04
U.S. Cl. 174—15 C 9 Claims



An low-temperature cable which can be electrically joined to, and structurally connected to, a similar cable within an means. The cable has an electrical conductor formed of a plurality of helically wound individual conductor sections internally supported by spaced support means. Insulation is helically wound in layers about the electrical conductor. The frictional resistance to movement of the electrical conductor within the insulation and over the support means due to temperature changes is reduced because the radial contraction of the insulation is equal to or smaller than the radial contraction of the electrical conductor and the radial contraction of the support means is equal to or greater than that of the conductor.

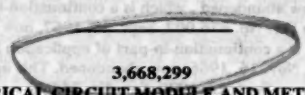
3,668,298

MULTICONDUCTOR COMMUNICATIONS CABLE

Walter L. Hawkins, Montclair, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1969, Ser. No. 883,973
Int. Cl. H02g 15/20
U.S. Cl. 174—23 C 1 Claim

A multiconductor communications cable includes a hydrophobic material filling the space between primary insulated conductors. Compatible filler-insulation materials designed for long-life stabilization are described. Insulation materials include various ingredients which stabilize the insulation and resist extraction by the filler.

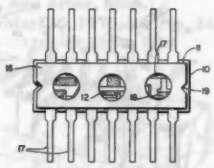


3,668,299

ELECTRICAL CIRCUIT MODULE AND METHOD OF ASSEMBLY

Jack D. McNeal, Long Beach, Calif., assignor to Beckman Instruments, Inc.

Filed Apr. 29, 1971, Ser. No. 138,587
Int. Cl. H05k 5/00
U.S. Cl. 174—52 PE 14 Claims



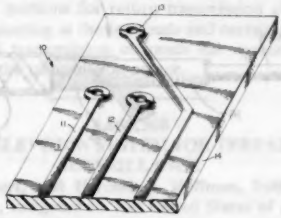
An encapsulated electronic module including a nonconductive substrate having attached thereto a plurality of electrical components and an electrical network of connectors attached to the substrate and forming termination pads adjacent the edges of the substrate to which leads are attached. A flat cover is disposed over the substrate but spaced therefrom; the cover having a hole formed therethrough through which an encapsulation material is inserted between the substrate and cover completely filling the space therebetween. The encapsulation material extends at least partially into the opening in the cover member thereby securely attaching the cover member to the base member and sealing the space between these members.

3,668,300

PRINTED CIRCUIT WITH SUBSTRATE OF AN OXYBENZOYL POLYESTER

Bernard E. Nowak, Lancaster; Steve G. Cottis, and James Economy, both of Buffalo, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed May 28, 1969, Ser. No. 828,692
Int. Cl. B32b 27/36; H01b 3/42; H05k 1/00
U.S. Cl. 174—68.5 6 Claims



A printed circuit comprising at least one conductor on a substrate of an oxybenzoyl polyester.

3,668,301

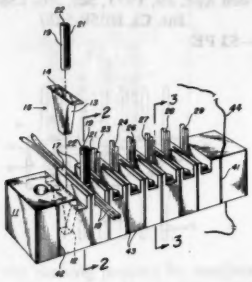
MEANS AND METHODS OF JOINING CONDUCTORS

Harry A. Faulconer, 8328 Center Drive, Le Mesa, Calif.

Continuation-in-part of application Ser. No. 316, Jan. 2, 1970, now abandoned , which is a continuation-in-part of application Ser. No. 676,002, Sept. 28, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 594,785, Nov. 16, 1966, now abandoned. This application Sept. 23, 1970, Ser. No. 74,907

Int. Cl. H02g *15/08*

U.S. Cl. 174—88 R 17 Claims



Method and apparatus for organizing and joining conductors of multi-conductor cables such as communication cables. An elongated multiple connector structure having a series of open-channels, the entrance ends of which are intersected by guide channels, each having a releasable holder at one end so that a bundle of wires may be separated, organized and held in the channels in bridging relation to connection sockets. Plugs are forced into the sockets and press bridging portions of the wires therein to strip the insulation and establish permanent electrical connections. Each socket is provided with a sharp edge to shear the excess portions of the wires as the plugs are forced into the sockets.

3,668,302

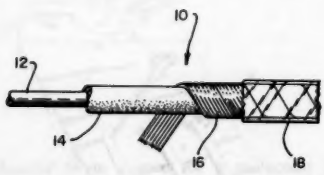
FLAME RETARDANT TEXTILE COVERED WIRE

Daniel Edmund Boland, Buffalo, N.Y.; Leonard S. Dewees, Baltimore, Md., and LeRoy M. Towsley, Berkeley Heights, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed July 25, 1968, Ser. No. 747,757

Int. Cl. H01b *7/00;* C09d *5/18*

U.S. Cl. 174—121 A 4 Claims



A textile served wire coated with a flame retardant lacquer comprised essentially of a mixture, by weight, of 100 parts cellulose acetate base, 35 parts tricresyl phosphate plasticizer, 42.5 parts tris (2, 3 - dibromopropyl) phosphate flame retardant, and 128.5 parts acetone solvent.

3,668,303

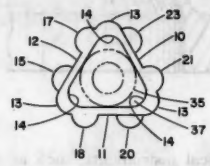
SUPPORTING INSULATOR FOR ELECTRICAL HEATING ELEMENTS

Donald E. Alexander, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 23, 1971, Ser. No. 155,953

Int. Cl. H01b *17/58;* H01c *1/02;* H05b *3/06*

U.S. Cl. 174—138 J 6 Claims



The insulator consists of a body of triangular shape pressed from refractory material and having a non-circular aperture for receiving the heater element. The outer surface of each side of the body is formed with a pair of projections spaced apart axially of the body. Preferably the projections of each pair are located adjacent the apexes of the triangular body and whereby the projections of each pair are also spaced apart in a direction lengthwise of each side.

3,668,304

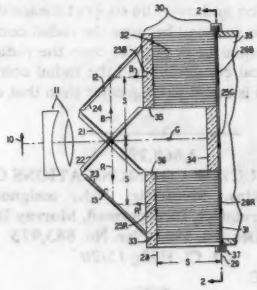
SINGLE PICKUP TUBE COLOR TELEVISION CAMERA

Robert Lewis Ellenberger, Colts Neck Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1970, Ser. No. 50,571. The portion of the term of the patent subsequent to Oct. 13, 1968, has been disclaimed.

Int. Cl. H04n *9/06*

U.S. Cl. 178—5.4 ST 8 Claims

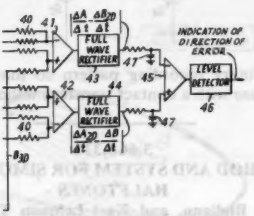


In a multiple-image/single-tube color camera an arrangement of air spaced dichroic layers splits image-forming white light into three distinct-color parallel beams. Fiber optic material is used to translate all of the color beams to a common target plane of the pickup tube upon which the photoconductive surface is deposited. In one embodiment the faceplate of the tube is a composite of fiber optic material and homogeneous glass. In another, the faceplate is formed exclusively of fiber optic material.

3,668,305
TELEVISION CAMERA REGISTRATION

Derek Thomas Wright, Crawley, England, assignor to The Marconi Company Limited, and Standard Telephones & Cables Limited, London, England

Filed Nov. 19, 1970, Ser. No. 90,991
Claims priority, application Great Britain, Nov. 24, 1969, 57,451/69
Int. Cl. H04n 9/08
U.S. Cl. 178—5.4 M **10 Claims**

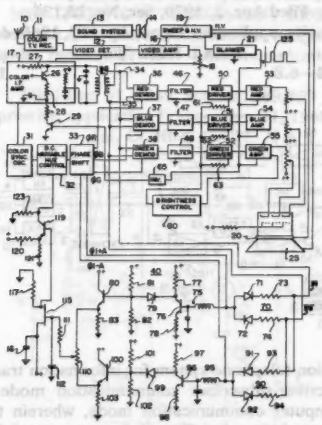


To detect misregistration in the outputs of two or more television camera tubes, the outputs of the tubes are subtracted and differentiated, the resultant being integrated and rectified, and a minimum then being detected in the amplitude of the integrated and rectified signal. The differentiation is achieved by delaying the signals and subtracting the delayed from the undelayed signals, the delay being an incremental delay to detect misregistration in the line scan direction or equal to one or more line periods for the field scan direction.

3,668,306
AUTOMATIC HUE CONTROL FOR A TELEVISION RECEIVER

Robert B. Hansen, Arlington Heights; Thomas W. Ivas, Evergreen Park, and William H. Slavik, Oak Lawn, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 19, 1969, Ser. No. 825,775
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 HE **16 Claims**

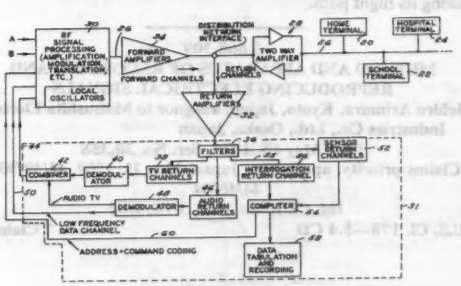


A color television receiver providing for the direct demodulation of the red, blue and green color representative signals includes an additional pair of hue control demodulators for demodulating color difference signals on opposite sides of the I-axis by equal amounts. The outputs of the hue control demodulators are inverted with respect to one another and are supplied to an adder, which provides a DC control voltage indicative of the relative difference in the amplitudes of the signals obtained from the hue control demodulators. This control voltage then is supplied to a DC controlled variable hue control circuit which shifts the relative phase between the color sync oscillator output and the subcarrier to the demodulators by an amount sufficient to maintain the average outputs of the two hue control demodulators equal in amplitude.

3,668,307
TWO-WAY COMMUNITY ANTENNA TELEVISION SYSTEM

William W. Face, Saline; Harold W. Katz, and Murray H. Miller, both of Ann Arbor, all of Mich., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed Mar. 30, 1970, Ser. No. 24,009
Int. Cl. H04n 7/18
U.S. Cl. 178—5.6 **13 Claims**



A two-way community antenna or closed circuit television system or community cable television system which permits two-way communication (including voice communication) through a transmission center from and between various terminals, such as schools, homes, hospitals, doctor's offices, community centers, industrial sites and the like. A control center including a properly programmed digital computer continuously interrogates the system over a forward control channel and receives responses from the terminals over a return control channel. The computer also controls transmissions between the transmission center and the terminals and between the terminals via the transmission center. Each terminal is provided with a control unit for communication with the control center. The system utilizes an appropriate bridging amplifier or other suitable means to convert to a two-way link a portion of the transmission cable interconnecting the transmission center and the terminals. The system also contemplates the use of channel allocations between 0 and 300 MHz, it being practical to allocate in this range certain portions for return transmission channels for programs originating at the terminals and certain portions for extra forward transmission channels for special programs originating at the transmission center.

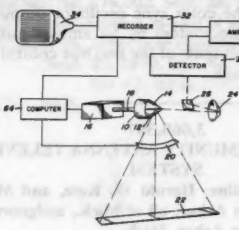
3,668,308
A TELEVISION SYSTEM FOR TERRAIN SURVEILLANCE

Warren T. Burt, and Herman J. Hoffman, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 20, 1970, Ser. No. 56,563
Int. Cl. H04n 3/32, 5/78, 7/02
U.S. Cl. 178—6.6 A **13 Claims**

A system for terrain surveillance from an aircraft utilizing a scanning optical system, a TV monitor, and a modified video recorder. A rotating mirror scans a section of the ter-

rain below the aircraft extending transversely to the aircraft flight path and directs the reflected light onto a photocell. The photocell signal forms the input to the video recorder and TV monitor. The TV display is unconventional in that



each frame presented has one new scan added and the lowermost old scan is removed and thus the pilot sees on his monitor a terrain picture which advances as the aircraft moves along its flight path.

3,668,309

METHOD AND APPARATUS OF RECORDING AND REPRODUCING ELECTRICAL SIGNALS

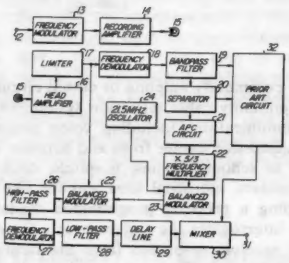
Ichiro Arimura, Kyoto, Japan, assignor to Matsushita Electric Industries Co., Ltd., Osaka, Japan

Filed May 18, 1970, Ser. No. 38,358

Claims priority, application Japan, May 21, 1969, 44/40793; 44/40794

Int. Cl. H04n *5/14, 5/78, 9/02*

U.S. Cl. 178—5.4 CD **7 Claims**



A recording and reproducing system having means for correcting a timing variation error (horizontal jitter) introduced into a reproduced signal as in magnetic recording and reproducing systems by frequency-multiplying a reference signal simultaneously reproduced during the reproducing process up to nearer the carrier frequency of the reproduced signal and using the frequency-multiplied reference signal and signals having frequencies higher than the frequencies of those signals to compensate the timing variation component in the reproduced signal.

3,668,310

MAGNETIC VIDEO RECORDING AND REPRODUCING APPARATUS

Osahiko Yano, Kadoma, and Mitsuaki Ono, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

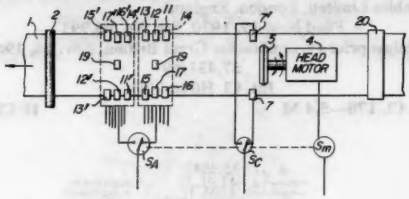
Filed June 2, 1970, Ser. No. 42,709

Claims priority, application Japan, June 5, 1969, 44/44779; 44/44778; June 10, 1969, 44/46661; 44/46662

Int. Cl. G11b *5/86, 21/00;* **H04n** *5/78*

U.S. Cl. 178—6.6 A **7 Claims**

A magnetic video recording and reproducing apparatus by which television signals can be recorded and reproduced in the form of an ordinary recording pattern and simultaneously television signals, if necessary, can be recorded in the form of a recording pattern having a mirror-image relationship with



the said ordinary recording pattern so that a master tape adapted for use with a contact transfer method is produced.

3,668,311

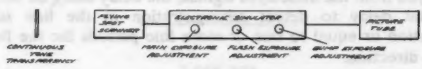
METHOD AND SYSTEM FOR SIMULATING HALFTONES

Robert Paul Bigliano, and Karl Lehman Thaxton, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1969, Ser. No. 878,161

Int. Cl. H04n *5/84*

U.S. Cl. 178—6.7 R **24 Claims**



A halftone screen process is electronically simulated to obtain exposure conditions for main and flash and/or bump exposures with different halftone screens and photographic films.

3,668,312

TELEVISION TELEPHONE SYSTEM

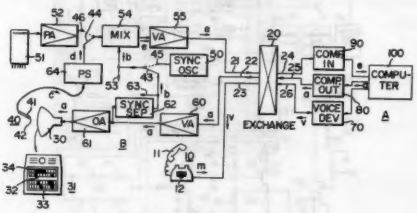
Kazuyuki Yamamoto, Tokorozawa, and Ryoichi Matsuda, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 2, 1970, Ser. No. 25,136

Claims priority, application Japan, Apr. 10, 1969, 44/27239

Int. Cl. H04n *7/00*

U.S. Cl. 178—6.8 **10 Claims**



A television-telephone system for information transmission in a subscriber-subscriber communication mode or subscriber-computer communication mode, wherein the information transmission is effected between an information receiving party and a transmitting party, which may be a computer. A position indicating signal can be sent back from the receiving party to the transmitting party by using a light-pen and a signal switching network. The position indicating signal is sent to the transmitting party to indicate a command of the receiving party by displaying the position indicating signal superposed on the transmitted picture, or this indica-

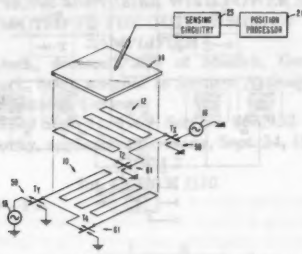
tion information may be further processed and utilized by the transmitting party to form a definite digital indication of the position information.

3,668,313

RESISTIVE GRID GRAPHIC DATA TABLET

Herbert Dym, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,462
Int. Cl. G08c 21/00
U.S. Cl. 178—19 5 Claims



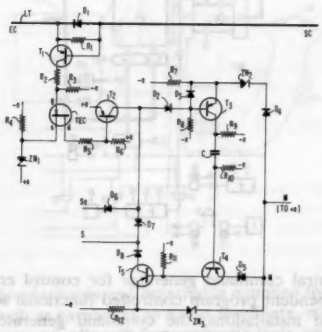
A two-dimensional graphic data entry tablet for transforming a positional information into a digital input to a computer system. The tablet structure consists of two continuous resistance lines superimposed on each other. Each of these lines being in the form of a grid and representing position in one of said two dimensions. A voltage differential is applied to each of the grids in order to create a voltage gradient along the path of the grid wires. An analog positional information is created by sensing grid voltage with a capacitively coupled stylus. By having the stylus viewing area cover a plurality of wires, the sensed potential averages out and represents a position directly related to the center location of the stylus on the faceplate of the tablet. The resistive grid lines provide the dual function of resistive bleeding and presenting a potential gradient to a capacitively coupled stylus.

3,668,314

SUPERVISORY CIRCUIT FOR ELECTRONICALLY MONITORING A TELEGRAPHY LINE

Claude Rousseau, Joinville-le-Pont, France, assignor to C.I.T. Compagnie Industrielle des Telecommunications, Paris, France

Filed Dec. 31, 1969, Ser. No. 889,359
Claims priority, application France, Dec. 31, 1968, 183136
Int. Cl. H04l 25/02
U.S. Cl. 178—69 G 18 Claims



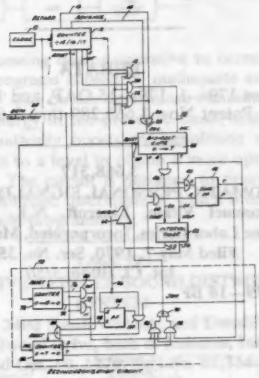
An electronic supervisory circuit indicates the condition of a telegraphy line being supervised without interfering with the transmission of the telegraphy signals. The supervisory circuit employs a holding circuit responsive to the detection of modulated line signals which maintains the output of the supervisory circuit during the periods when the modulated signals are transmitted over the telegraphy line. An auxiliary output is also employed to indicate the instantaneous condition of the line.

3,668,315

RECEIVER TIMING AND SYNCHRONIZATION SYSTEM

James O. Heitzman, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 15, 1970, Ser. No. 37,790
Int. Cl. H04n 1/36
U.S. Cl. 178—69.5 R 14 Claims



A receiver timing and synchronization system useful in a digital data communication system for providing timing signals synchronized with received digital data. The receiver system includes means for providing small incremental changes in the locally generated timing signals to maintain synchronization as well as means for enabling synchronization to be maintained during signal fades. In addition, means are provided for rapidly re-synchronizing the timing signals to data received from a new transmitter. Incremental timing signal adjustments are made by determining whether a data signal transition occurs during an early, on time, or late portion of a bit period. If a data transition occurs during early or late portions, the timing signal is either incrementally advanced or retarded. If data transitions occur during corresponding portions of n successive bit periods outside of the on time portion, then the timing signal is jammed into synchronization with the recurring data transitions.

3,668,316

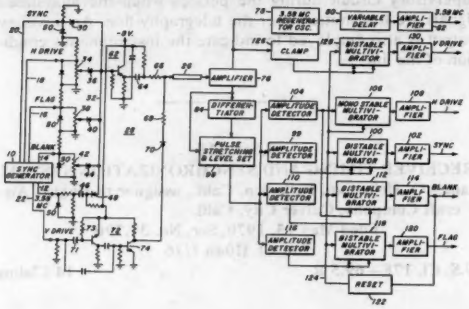
TRANSMISSION SYSTEM FOR OVERLAPPING PULSES

Irving Moskovitz, Roslyn Heights, N.Y., assignor to Riker Communications Inc.

Filed Jan. 31, 1968, Ser. No. 701,955
Int. Cl. H04n 5/06; H03k 5/20, 5/08
U.S. Cl. 178—69.5 TV 8 Claims

A system for combining discrete, overlapping electrical signals and for transmitting the signals over a single conduc-

tor rather than a plurality of conductors, the composite transmitted signal being decoded at a receiving station into the discrete separate signals from which it was formed.



ERRATA

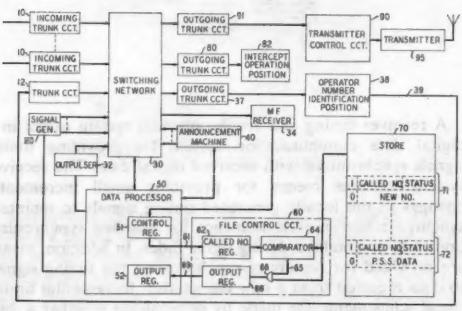
For Classes 179—1, 179—15 OAP, and 179—1 OCM see: Patent Nos. 3,668,289 thru 3,668,291

3,668,317

AUTOMATIC PERSONAL SIGNALING SYSTEM

Alfred Emanuel Vitalo, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 7, 1970, Ser. No. 35,402
Int. Cl. H04m *3/50*
U.S. Cl. 179—18 BF **5 Claims**



Telephone switching system automatic intercept facilities are utilized in combination with radio signal transmission circuitry to provide personal signaling or paging service.

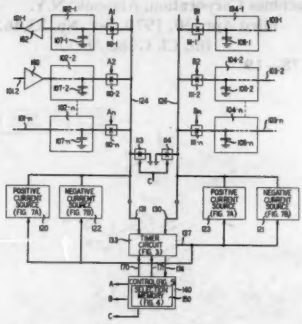
3,668,318

TIME DIVISION HYBRID ARRANGEMENT

Floyd Kenneth Becker; James Owen Dimmick; Theras Gordon Lewis, and John Francis O'Neill, all of Boulder, Colo., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Dec. 14, 1970, Ser. No. 97,887
Int. Cl. H04j *3/02*
U.S. Cl. 179—15 AA **9 Claims**

In a time division hybrid arrangement first and second storage devices of one group of storage devices connectable to a common bus are connected to an outgoing line and an incoming line respectively. A third storage device of a group of storage devices connectable to a second common bus is coupled to a bidirectional line. During a first time slot, the first and third storage devices are connected to their common buses; the signal difference between the first and the third storage devices is detected; and distinct signals are applied to the first and third storage devices for a time interval corresponding to the detected difference. In the immediately



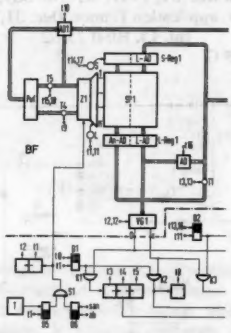
successive time slot, the second and third storage devices are connected to their common buses; the signal difference between the second and third storage devices is detected; and distinct signals are applied to the second and third storage devices for a time interval corresponding to the detected difference in the immediately successive time slot.

3,668,319

CENTRAL COMMAND GENERATOR FOR TIME DEPENDENT PROGRAM CONTROLLED FUNCTIONAL SEQUENCES IN TELECOMMUNICATION EXCHANGE INSTALLATIONS

Peter Gerke, Grafelfing; Hans Baur, Munich; Karl Rutkowski, Pullach; Hans-Eugen Binder, Gauting; Helmut Palsa, Oberbachern, and Hartmut Fablanke, Dusseldorf-N, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 21, 1969, Ser. No. 826,432
Claims priority, application Austria, May 24, 1968, A 5014/68
Int. Cl. H04m *15/00*
U.S. Cl. 179—18 ES **8 Claims**



A central command generator for control commands of time-dependent program controlled functional sequences in exchange installations, the command generator having a pulse generator and at least one counting register with individual stages. At least one separate storage segment is assigned to each individual stage. Means are provided to re-

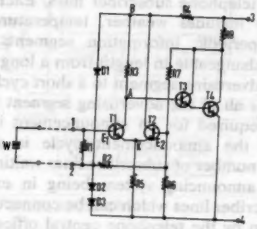
gister the identification addresses of the control commands after the expiration of a predetermined time interval or for the counting off of predetermined time intervals, in the corresponding storage segment assigned to that stage of the counting register which follows the stage identified by the counting register, by a number of stages equal to the quotient of the associated time interval and the basic period of the counting register.

3,668,320

CONNECTION ARRANGEMENT FOR A TELEPHONE MICROPHONE AMPLIFIER WITH POWER SUPPLY CONNECTED TO THE OUTPUT SIDE OF THE AMPLIFIER

Wolfgang Duck, deceased, late of Munich, Germany (by Hertha Duck, heir), assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 11, 1969, Ser. No. 856,933
Claims priority, application Germany, Sept. 24, 1968, P 17 62 924.2
Int. Cl. H03f 3/10
U.S. Cl. 179—1 A **2 Claims**



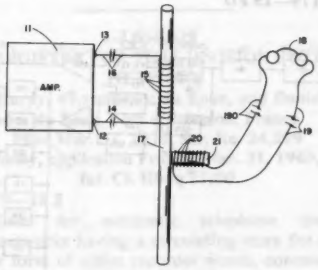
A speech amplifier for telephone microphones including an input direct coupled, differential amplifier, and an output Darlington-connected amplifier, with the operating points stabilized by forward-biased diodes.

3,668,321

MAGNETIC COUPLER

Henry C. Lang, 73 Winter Street, Waltham, Mass.

Filed Aug. 11, 1970, Ser. No. 62,858
Int. Cl. H01f 27/26
U.S. Cl. 179—1 PC **6 Claims**



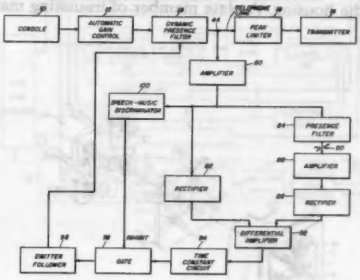
An easily attachable and detachable coupling for electrical systems, such as earphones to audio amplifiers, comprising a coil on a magnetically soft ferromagnetic body and a second coil mounted on a permanent magnet. The first coil can be connected to an audio signal and the second coil connected to a pair of earphones.

3,668,322

DYNAMIC PRESENCE EQUALIZER

Richard G. Allen, Pound Ridge, N.Y., and Emil Torick, Darien, Conn., assignors to Columbia Broadcasting System, Inc.

Filed June 18, 1970, Ser. No. 47,214
Int. Cl. H03g 3/24
U.S. Cl. 179—1 VL **14 Claims**



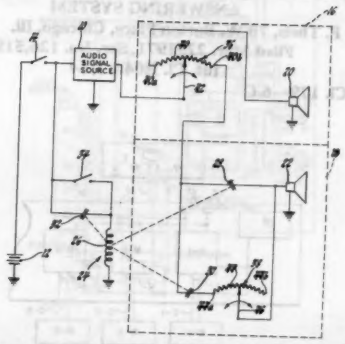
A speech processing device operative to correct deficiencies in speech programs caused by inadequate energy in the "presence band." The device determines the relative amount of total signal energy in the presence band, and, if it is inadequate, automatically boosts the amplitude of presence band components to a level to obtain a more optimum spectral distribution. The circuit is designed to operate with an automatic speech-music discriminator which inhibits control action during music programming.

3,668,323

AUTOMOTIVE VEHICLE SOUND DISTRIBUTION SYSTEM

Thomas H. Lee, 2400 South Wabash, and Donald E. Brinkerhoff, 3020 Dellwood Drive, both of Kokomo, Ind.

Filed Oct. 19, 1970, Ser. No. 81,714
Int. Cl. H04r 5/02
U.S. Cl. 179—1 VE **2 Claims**



In an automotive vehicle, a relay is manually operable to shift control over the sound level of a rear seat speaker from a front seat fader exclusively to a rear seat fader and the front seat fader collectively.

3,668,324

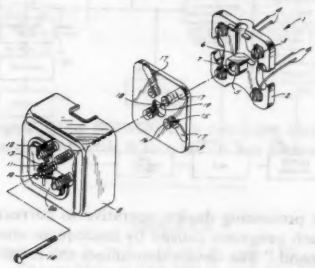
TELEPHONE ADAPTER

Jerome Firestone, Mount Vernon, N.Y., assignor to Saxton Products, Inc., Congers, N.Y.

Filed Feb. 26, 1971, Ser. No. 119,306
Int. Cl. H04m 1/72
U.S. Cl. 179—1 PC **10 Claims**

A telephone adapter for use with a telephone terminal unit having a plurality of contacts each of which is connected

with a telephone wire. The adapter has a housing provided opposite an open side thereof with a transverse wall formed with a plurality of apertures therethrough. The number of apertures corresponds to the number of contacts on the terminal unit with which the adapter is to be used. In the interior of the housing is located a plurality of axially compressible helical contact springs each aligned with one of the apertures and so dimensioned as to frictionally engage a contact pin which is pushed through a respective aperture from the outer side of the housing. A plate member of insulating material is



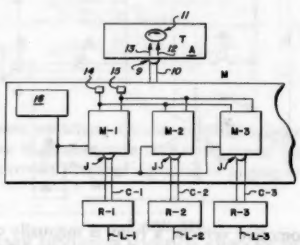
received through the open side in the housing and has at one major surface which faces the springs projecting pins which are each conductively received in an adjacent end of one of the springs, and on the opposite major surface the plate member has contact strips which are each conductively connected with one of the pins and which, when the housing is connected by means of connecting means provided for this purpose with the terminal unit, each engage one of the contacts on the terminal unit.

3,668,325

MULTIPLIER CIRCUIT FOR AUTOMATIC TELEPHONE ANSWERING SYSTEM

Peter F. Theis, 70 W. Burton Place, Chicago, Ill.

Filed Mar. 22, 1971, Ser. No. 126,519
Int. Cl. H04m 1/64
U.S. Cl. 179—6 C **2 Claims**



A multiplier circuit for an automatic telephone answering system allows a single automatic answering unit to service a number of telephone lines simultaneously.

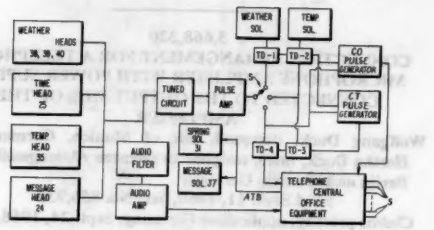
The system provides two message cycles to the first caller and then shuts off. Additional calls may be received and served at the same time, with each hearing the remaining portion of the message cycle then in progress plus one additional complete message cycle.

3,668,326

VARIABLE MULTIPLE PERIODIC AND APERIODIC ANNOUNCEMENT SYSTEM

Ellis H. Bryant, Jr., and Leary W. Smith, both of Atlanta, Ga., assignors to The Audichron Company, Atlanta, Ga.

Filed Feb. 11, 1970, Ser. No. 10,386
Int. Cl. H04m 1/64
U.S. Cl. 179—6 TA **8 Claims**



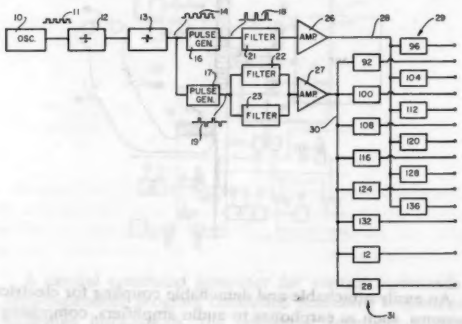
An announcing system for providing a family of recorded announcements through telephone central office equipment to one or more telephone subscriber lines. Each announcement selectively includes weather, temperature, or other periodic and aperiodic information segments. Each announcement is changeable in length from a long cycle which includes a full advertising segment to a short cycle in which a major portion or all of the advertising segment is deleted so that the time required for an announcement is shortened. The length of the announcement cycle is shortened in response to the number of subscriber lines waiting to be connected to the announcing system being in excess of the number of subscriber lines which can be connected to the announcing system by the telephone central office equipment. However, the announcing system also provides for deleting segments of an announcement which are in error without changing the length of the announcement cycle or it being apparent that the announcement segment has been deleted. The weather segment of the announcement is determined by different three digit weather codes and by changing the positions of a plurality of weather announcing heads along a weather announcing drum in response to a plurality of resistances corresponding to the three digit weather codes.

3,668,327

CARRIER SUPPLY FOR MULTIPLEX COMMUNICATION SYSTEM

William H. Euchner, and Eugene Y. Ho, both of San Carlos, Calif., assignors to Farinon Electric, San Carlos, Calif.

Filed Nov. 20, 1969, Ser. No. 878,426
Int. Cl. H04j 1/20
U.S. Cl. 179—15 FD **4 Claims**



A carrier frequency supply including frequency dividers serves to receive a master frequency and form low frequency

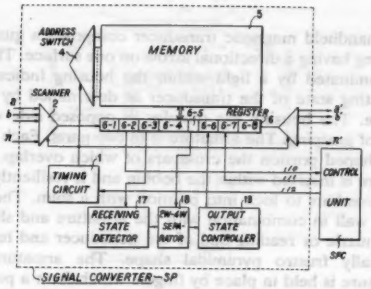
pulses having a high harmonic content. Filter means receive said pulses and filter out unwanted frequencies including the fundamental. The output of the filter is applied to a single harmonic amplifier which amplifies the harmonic frequencies and supplies the same to individual filters, each of which selects a carrier frequency from the harmonic frequencies.

3,668,328

TIME-DIVISIONAL CONNECTION SYSTEM FOR A PLURALITY OF DIGITAL COMMUNICATION CIRCUITS

Yukio Nakagome; Hiroichi Teramura; Yasuo Fukata, all of Tokyo, and Sumitoshi Ando, Ohmiya, all of Japan, assignors to Kadusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Mar. 26, 1970, Ser. No. 22,805
Claims priority, application Japan, Mar. 26, 1969, 44/22395
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AQ **4 Claims**



A time-divisional connection system for a plurality of digital communication circuits for connecting time-divisionally, for each communication circuit in a characterwise manner, between one and the other of each pair of two-way digital communication circuits by means of four-wire terminal equipment. The system includes a detector for detecting time-divisionally, for each communication circuit, whether or not a time-serial character exists at one of the input and output terminals of the four-wire terminal equipment for each communication circuit, and means responsive to the output of the detector for interrupting one of two paths from the input terminals to the output terminals of each communication channel in the four-wire terminal equipment during the duration of the detected character or characters in order to prevent an undersired sending-out or receiving of the detected time-serial character signal.

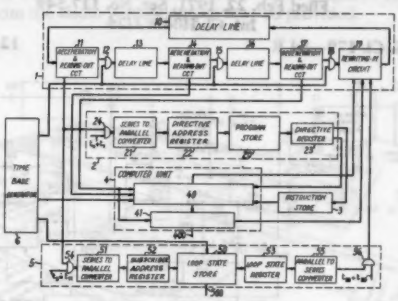
3,668,329

MULTIREGISTER FOR TIME-DIVISION SWITCHING NETWORK

Daniel G. Hardy, 47 residence du Raux, and Daniel E. Goby, 62 residence du Raux, both of Lannion, France

Filed Mar. 31, 1970, Ser. No. 24,299
Claims priority, application France, Mar. 31, 1969, 6909723
Int. Cl. H04q *11/00*
U.S. Cl. 179—18 J **2 Claims**

Multiregister for automatic telephone time-division switching networks having a circulating store for subscriber data in the form of series recorder words, constructions for modifying the breaking or making of subscribers+ circuits, booking access circuit and rebooking circuit for entering modified data, three read-out circuits in the store, and first, second and third series-parallel converters connected to the read-out circuits, whereby a directive address in the circulating store from the first series to parallel converter goes to a processing unit in the second and third series to parallel converter and is modified by the modifying data to permit the modified data to be collected and processed in parallel from the read-out circuits while this modifying data advances into



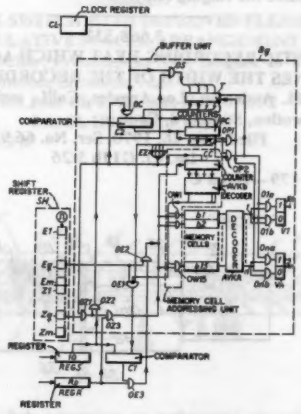
the circulating store, the data after modification being entered in series.

3,668,330

ARRANGEMENT FOR CONTROLLING DEVICES TRANSMITTING DIGITAL PULSES IN A COMPUTER CONTROLLED TELECOMMUNICATION SYSTEM

Goran Anders Henrik Hemdal, Tyreso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 22, 1969, Ser. No. 887,098
Claims priority, application Sweden, Jan. 8, 1969, 185/69
Int. Cl. H04q *1/32*
U.S. Cl. 179—18 ES **4 Claims**

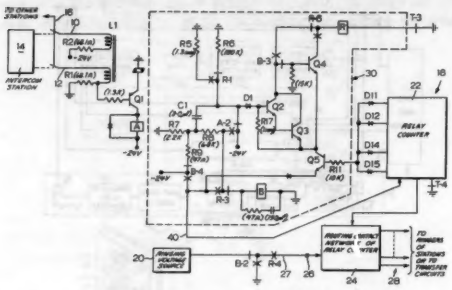


There is disclosed an arrangement in a stored program controlled telephone exchange for controlling devices emitting pulse series corresponding to dialed digits. The arrangement comprises a number of buffer units which are scanned, when a certain digit is to be emitted from a certain device, in order to determine either if there exists an idle unit from which the pulse series emitting device could be controlled or if there exists a unit in which there are a required number of control signals corresponding to the certain digit, in which latter case these signals are supplied to the device in question.

3,668,331
TIMING AND CONTROL CIRCUIT FOR INTERCOM TELEPHONE SYSTEM

Wesley John Warner, Mississauga, Ontario, Canada, assignor to Northern Electric Company Limited, Quebec, Canada

Filed Feb. 22, 1971, Ser. No. 117,549
Int. Cl. H04m 1/26
U.S. Cl. 179—84 R 12 Claims

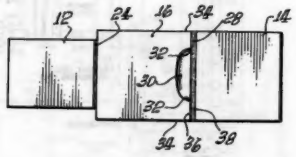


In an intercom telephone system, a timing capacitor located in a charging circuit has one terminal connected in the base circuit of a high gain transistor circuit. A pulsing relay follows dial pulses received and clamps the capacitor terminal voltage during each dial pulse. At the end of dialing, the pulsing relay remains operated, allowing the capacitor terminal voltage to rise sufficiently to trigger the transistor circuit, which operates a ringing relay. The ringing relay causes discharge of the capacitor and release of the transistor circuit, increases the time constant in the charging circuit, and initiates ringing for a timed period until the capacitor recharges sufficiently to retrigger the transistor circuit, which then releases the ringing relay.

3,668,332
MAGNETIC RECORDING HEAT WHICH ACCURATELY DEFINES THE WIDTH OF THE RECORDING TRACK

Harold M. Anderson, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1970, Ser. No. 66,930
Int. Cl. G11b 5/26
U.S. Cl. 179—100.2 C 22 Claims

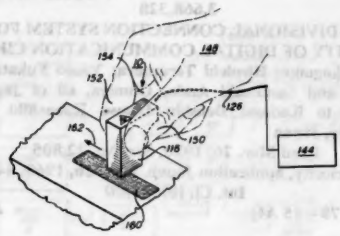


A magnetic recording head having a read-write gap and an erase gap adjacent a common core. The read-write gap is of a predetermined width equal to or less than the width of the common core. Within the common core, in the surface adjacent the erase gap, there is a notch of predetermined width less than the predetermined width of the read-write gap. The notch is of sufficient depth to minimize the erase function of that portion of the erase gap opposite thereto. In operation, the initial width of the magnetically recorded information, as determined by the width of the read-write gap, is cropped to the predetermined width of the notch during erasure. Accurately defined tracks of extremely narrow width may be attained with this recording head thereby permitting an increase in the number of tracks recorded per unit with of the magnetic storage medium.

3,668,333
HANDHELD TRANSDUCER OPERATING STATE INDICATOR

Melvin Kamenir, West Orange, N.J., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Sept. 4, 1969, Ser. No. 862,608
Int. Cl. G11b 5/10, 19/16
U.S. Cl. 179—100.2 C 4 Claims

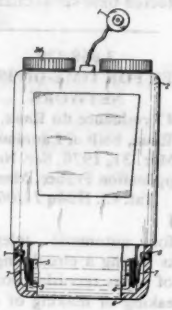


A handheld magnetic transducer comprises a gun-shaped housing having a directional arrow on one surface. The arrow is illuminated by a light within the housing indicating the operating state of the transducer as determined by a signal device. The housing has dimples in opposed side walls for ease of grasping. The armature is in two parts. Each part has a T-shaped portion the crossbars of which overlap. The armature is inserted within the bobbin and is resiliently held at the crossbars to lock into position with a shim. The bobbin front wall in combination with the armature and shim form the muzzle or reading end of the transducer and has a substantially frustro pyramidal shape. The armature-bobbin structure is held in place by fingers which form a part of the transducer housing. The wires from the coil are secured to clips. The clips or terminal are U-shaped members spring retained on arms of the bobbin. The clips each have a flange portion for engaging an aperture in the arm. The reading portion of the transducer is hemispherical in shape with the gap defining an arc thereon such that the transducer is capable of rotation or positioning about one of three axes while moving relative to a record.

3,668,334
HEARING AID WITH CHANGEABLE BATTERY COVER CONTAINING RF PICKUP COIL

William O. Schwake, Sulphur, Okla., assignor to Radiocar Corporation, Canonsburg, Pa.

Filed May 7, 1970, Ser. No. 35,464
Int. Cl. H04r 25/00
U.S. Cl. 179—107 R 9 Claims



A hearing aid has a pair of spaced electric contacts projecting from its case in a position to hold a battery between them for operating the hearing aid. A removable housing with an open inner end normally fits over these contacts to

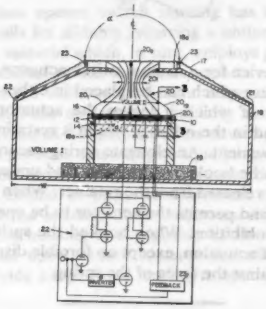
conceal the battery. The housing contains a radio-frequency pickup detection circuit connected with a radio-frequency pickup coil and provided with a pair of terminals. The hearing aid case has means projecting from it into the housing and detachably engaging the pair of terminals therein to connect the radio-frequency detection circuit with the amplifier in the case. A pickup coil tuned to a different radio-frequency can be connected to the case by simply replacing the housing with a similar one containing such a coil.

3,668,335

ELECTROSTATIC LOUDSPEAKER

Harold N. Beveridge, 1616 Franceschi Road, Santa Barbara, Calif.

Filed June 17, 1969, Ser. No. 833,952
Int. Cl. H04r *19/02*
U.S. Cl. 179—111 R **22 Claims**



An electrostatic loud speaker system is shown which combines a balanced transducer, an amplifier and an enclosure each of unique construction which together permit the reproduction of frequencies over the full audio range. The electrostatic transducer is shown surrounded by an enclosure that has an outlet passage preferably significantly smaller than the transducer and an acoustic lens preferably guides the sound through the narrow outlet into a wave form of circular cross-section. By these provisions a low resonant frequency for the speaker and wide dispersal of the directional high frequencies are achieved in an enclosure of limited size. The fixed electrodes of the transducer are of substantial thickness and are formed of high dielectric constant material, achieved preferably by molding a lower K matrix with additives raising K and lowering volumetric resistivity. The amplifier is formed of series-connected active devices, one controlled by the other. A third active device amplifies the audio signal. Its output is connected to control the first of the series-connected devices and the output terminal of the amplifier is connected through a resistive feedback path to the output of the third device. A further feedback system employs a carrier wave applied to the diaphragm of the transducer. The resulting signal on the electrodes is differentiated and negatively fed back to damp speaker response at low frequency resonance.

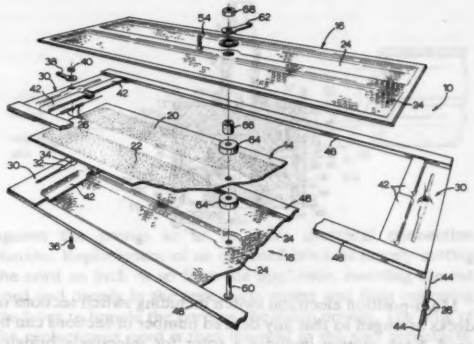
3,668,336

AUDIO SYSTEM INCLUDING ELECTROSTATIC LOUDSPEAKER

William M. D. Wright, Thornhill, Ontario, Canada, assignor to Dayton Wright Associates Limited, Toronto, Ontario, Canada

Filed Dec. 8, 1969, Ser. No. 883,143
Int. Cl. H04r *19/02*
U.S. Cl. 179—111 R **17 Claims**

An audio system including the last stage of the audio amplifier as an audio frequency voltage output source, a DC source providing a substantially constant charge so as to define and maintain an electrostatic field, and an electrostatic loudspeaker wherein the electrostatic field is maintained between electrodes and the audio frequency voltage output is impressed on the electrostatic field. Negative feedback from the audio voltage output may be provided.



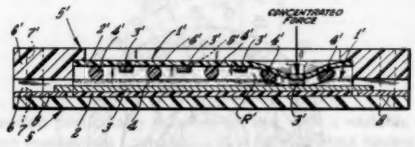
The electrostatic loudspeaker is assembled so as to include spacer blocks on either side of a movable diaphragm, and clamped between two rigid, outer electrodes. An electrical connection is passed through the spacer blocks so that both outer electrodes may have electrical connections made to each, respectively, on one common side of the loudspeaker assembly.

3,668,337

MATRIX SWITCH WITH IMPROVED FLEXIBLE INSULATIVE SPACER ARRANGEMENT

William Y. Sinclair, Frenchtown, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 18, 1971, Ser. No. 107,192
Int. Cl. H01h *9/26, 13/26*
U.S. Cl. 200—5 A **12 Claims**



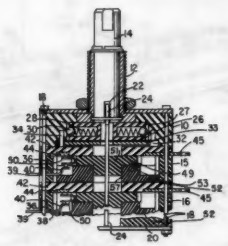
A matrix switch comprises an orthagonal arrangement of two sets of parallel conductors spaced from one another by a plurality of resilient elements. Preferably, the switch is made by securing together two one-sided flat conductor cables, each of which comprises a plurality of alternating, parallel conductors and elastomeric elements, with the heights of said elastomeric elements being greater than the heights of said conductors. Each cross-over point of the spaced conductors forms a switch point which is activated upon depression of the upper conductor into contact with the lower conductor. The orthogonally disposed flat conductor cables are held in a suitable housing including printed circuit board pads to which the conductors are connected, thereby facilitating simultaneous connection of the conductors to conventional multi-pin printed circuit board connectors for connection to the electronics used in conjunction with the matrix switch.

3,668,338

MINIATURE AXIAL BRIDGING ROTARY SWITCH WITH IMPROVED HOUSING

Thomas J. O'Malley, Brookfield, Ill., assignor to Grayhill, Inc., La Grange, Ill.

Filed Feb. 1, 1971, Ser. No. 111,545
Int. Cl. H01h 19/58, 21/78
U.S. Cl. 200—11 A 11 Claims



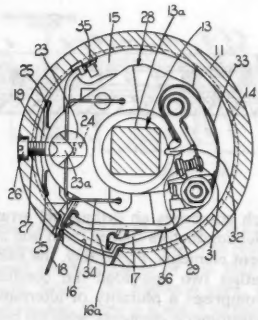
Multi-position electrical switch including switch sections or decks arranged so that any desired number of sections can be used. Each section includes a rotor for selectively bridging switch contacts which can be arranged in different manners as required in different applications. A large number of switch positions, for example, 24, can be provided in a very small switch structure. The individual contacts for the different positions are embedded in a plastic insulating member to provide a solid insulated support therefor.

3,668,339

IGNITION DISTRIBUTOR WITH A SUPPORT PLATE FOR THE CONTACT ASSEMBLY HELD IN POSITION BY ZONE RESILIENCE

William Harold Cooksey, Walsall, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 1, 1967, Ser. No. 657,630
Claims priority, application Great Britain, Aug. 23, 1966, 37,673/66
Int. Cl. H01h 19/62
U.S. Cl. 200—19 7 Claims



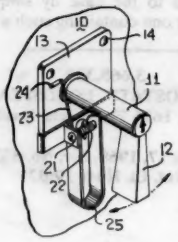
An ignition distributor including a casing, a rotatable shaft extending axially within the casing of the distributor, and carrying the rotor arm of the distributor, and a plate supported within the casing and carrying the contact breaker assembly of the distributor, said plate being engaged with the inner surface of the casing by virtue of its own resilience, the plate being flexed during insertion into the casing and the casing being shaped to locate the plate in its correct position.

3,668,340

LATCH FOR A SWITCH ACTUATOR

Eugene H. Brown, 2518 Hart Street, Dodge City, Kans.

Filed Oct. 9, 1970, Ser. No. 79,440
Int. Cl. H01h 27/00
U.S. Cl. 200—42 T 2 Claims



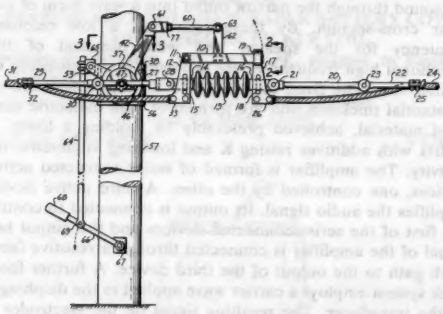
A latching device for a manual switch actuator, including a U-shaped retainer which can be placed in either of two conditions, in one of which it leaves the actuator free to be manipulated and in the other of which it restrains the actuator against movement. An elongate spring secured to a base at one end can be hooked at its other end under an edge of the retainer, or released from the retainer. When released the retainer drops and permits the actuator to be operated at will subject to no inhibition. When hooked the spring locks the retainer against actuation, except on forcible displacement of the retainer against the force of the spring.

3,668,341

SWITCH FOR POWER LINES ACTUATED BY A ROTATABLE SUPPORTING INSULATOR

Paul A. Smedley, 3780 Canfield Road, Pasadena, Calif., and Anderson B. Smedley, 1191 Morada Place, Altadena, Calif.

Filed Oct. 21, 1970, Ser. No. 82,734
Int. Cl. H01h 31/00
U.S. Cl. 200—48 R 15 Claims



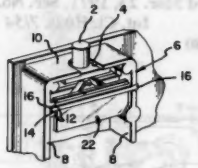
A switch for power lines which is actuated by a supporting rotatable insulator. A first insulator has a bearing at each end, one to be attached to a support such as a pole, and the other to the conductor of the power line. The first insulator is freely rotatable without moving the conductor. A second insulator structurally interconnects two segments of the conductor, and a movable switch blade movable by rotation of the first insulator connects or interconnects the segments.

This invention makes possible the innovation of remotely-actuated group operation of a plurality of in-line switches, in addition to its capability of individual operation of a single switch.

3,668,342
CAN OPENER SWITCH

James Pritulsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 29, 1971, Ser. No. 167,304
Int. Cl. H01h *21/00, 3/16*
U.S. Cl. 200—52 R 11 Claims

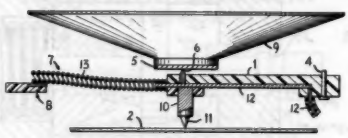


A metal can opener switch housing has slotted, spaced apart side walls for slidably receiving a unitary switch frame of insulating material which, in turn, employs parallel, spaced apart walls. Offset switch terminal supports extend transversely between the walls and adjacent respective ends of the switch frame. First and second similarly configured switch terminals formed of flat strip stock have web portions on the supports and portions extending obliquely beyond one side of the frame and away from respective ends, defining contact ends which extend in opposite directions and are spaced apart due to the spacing of the supports. A leaf spring integral with the housing is engageable by the overlapping or outer terminal upon flexure towards the other side of the frame to provide a high force tending to open the switch.

3,668,343
SOUND PLAYBACK DEVICE WITH IMPROVED COIL SPRING PICK-UP ARM

Corrado Raffaeli, Via dei Chiavari 6, and Guiliana Somigli, Via Leopoldo Ruspoli 40, both of Rome, Italy

Filed Jan. 30, 1970, Ser. No. 7,181
Claims priority, application Italy, May 3, 1969, 36888 A/69
Int. Cl. H01h *1/22*
U.S. Cl. 200—52 R 3 Claims



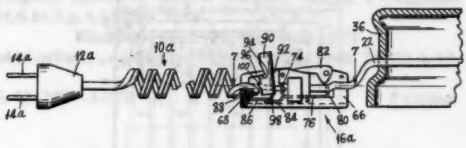
A phonograph has a pivoted pick-up arm and a switch comprising a first contact member protruding from said arm and arcuately movable over at least one second contact member. Operation of said switch actuates circuits for the function of auxiliary devices during playback.

3,668,344
QUICK REPLACEMENT, SLACK TAKE-UP ELECTRIC CORD WITH IMPROVED SWITCH, DETACHABLE ELECTRICAL CONNECTOR MEANS

Herbert G. Lehmann, 5 Kent Road, Easton, Conn.

Filed May 4, 1970, Ser. No. 34,324
Int. Cl. H01h *35/00*
U.S. Cl. 200—52 R 5 Claims

A quick replacement, slack take-up electric cord for lamps, clocks, radios, etc, comprising a length of two-conductor lamp cord coiled and permanently set in a helix, one end of the lamp cord having a conventional two-prong electric plug for insertion in a wall receptacle. The other end of the cord has a special elongate receptacle made with a recess at the end opposite to the entrance of the cord. The receptacle has a push-button switch and a flat base for support on a table surface. Within the receptacle are two metal connector pieces having sharp prongs located at the inner end of the recess. The recess is oblong in cross sectional configuration to receive a freshly cut end portion of the original electric cord from the appliance, where it has been cut close to the appliance. The receptacle also has a manually operable lever to force the said cut end of the appliance cord laterally

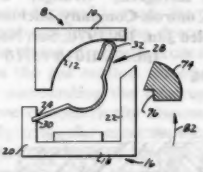


against the prongs so as to make electrical connection thereto. Replacement of an old cord involves merely cutting the cord an inch or so from the appliance, inserting the cut cord end deeply in the receptacle recess and then operating the lever to impale the cord on the sharp prongs. The plug of the replacement cord is then inserted in the wall receptacle. The receptacle switch will now be conveniently accessible to switch the appliance on and off.

3,668,345
ELECTRIC SWITCH WITH IMPROVED CAM OPERATED PIVOTED CONTACT

Oka Tsumoru, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1970, Ser. No. 79,032
Claims priority, application Japan, Oct. 14, 1969, 44/98006
Int. Cl. H01h *1/06, 1/34*
U.S. Cl. 200—6 BB 21 Claims



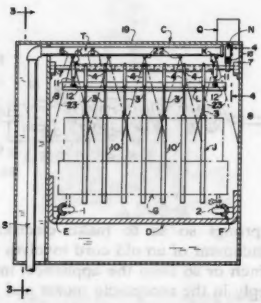
A switch particularly adapted for use with a variable resistance mechanism comprises a first fixed contact having an arcuate contact edge, a second generally U-shaped fixed contact spaced from said first fixed contact, and a resilient movable contact, one end of which is secured to one leg of the second fixed contact, said movable contact being normally flexed with its other free end biased into engagement with the arcuate edge of said first fixed contact. A rotor is provided with an integrally formed projection having a recess adapted to engage the free end of said movable contact in confining relationship. Electrical connection between the first and second fixed contacts through the movable contact is broken as the rotor is rotated in one direction engaging the free end of the movable contact in the recess formed in said projection. The rotation of the rotor in the opposite direction allows the movable contact to resile into operative electrical engagement with said first fixed contact. This is accomplished by means of a stop member on the other leg of said second fixed contact adapted to engage the free end of said movable contact.

3,668,346

SWINGABLE COMB FOR CLOSING MAGNETIC SWITCH FOR CONTROLLING HOT RINSE WATER IN A DISHWASHER

Tore H. Noren, 1350 Donner Avenue, San Francisco, Calif.

Filed Jan. 11, 1971, Ser. No. 105,471
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.41 **4 Claims**



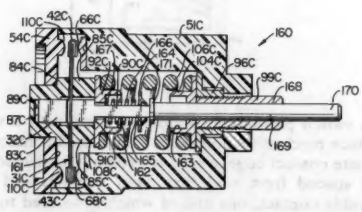
A dishwashing machine having a hot water rinse compartment through which a train of dish-carrying dollies is moved and a switch actuating comb is mounted in the compartment and has depending tines that are swung in one direction by a dish basket carried by a dolly so as to close a magnetic switch that opens a solenoid valve for spraying rinse water onto the dishes. The comb tines are so mounted that they can freely swing in the opposite direction should it become necessary to reverse the movement of a dolly and its dish basket in the rinse compartment and the magnetic switch will not be closed and neither will the tines be damaged.

3,668,347

SNAP ACTING ELECTRICAL SWITCH CONSTRUCTION HAVING RESET MEANS

Theodore Y. Korsgren, Orange, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 19, 1970, Ser. No. 3,833
Int. Cl. H01h *15/18*
U.S. Cl. 200—76 **16 Claims**



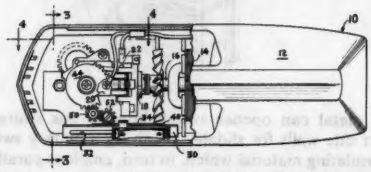
A snap blade carried by a housing means and having an opening means passing therethrough, an actuator member interconnected to said snap blade to cause the snap blade to snap to different positions thereof as the actuating member is moved relative to the housing means for an electrical switching function. The actuating member is disposed in the opening means of the blade and has opposed ends extending from opposite sides thereof. A cup-shaped plunger member receives one of the ends of the actuator member in the open end thereof and has abutment means extending from the open end and being received in the opening means of the blade to provide for manual reset of the switch construction. The housing means comprises a body member and a cover member, the body member having four like terminal mounting slots arranged in annular fashion therein and each being adapted to receive a contact carrying terminal.

3,668,348

KITCHEN MIXER

Charles L. Bauer, Cheshire, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Mar. 23, 1971, Ser. No. 127,149
Int. Cl. H02k *7/54*
U.S. Cl. 200—80 **1 Claim**



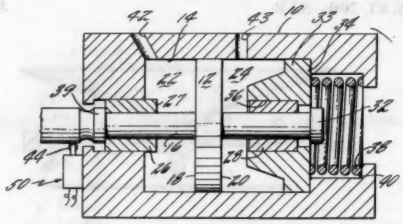
Kitchen mixer includes an external speed control slider and a pivotable centrifugally operated switch. A connecting arrangement is provided between said control slider and said centrifugally operated switch. A peripherally toothed face cam is arranged to swing said switch. This is effected by the cam-teeth which are connected through a spur gear train to the rack gear carried by said slider.

3,668,349

PROPORTIONAL PRESSURE DIFFERNCE ACTUATOR

Jerome G. Duchesneau, Andover, and Robert A. Schwartz, Vernon, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 12, 1971, Ser. No. 123,507
Int. Cl. H01h *35/38*; F01b *7/04*
U.S. Cl. 200—82 R **7 Claims**



Actuation of a pressure actuator is manifested solely when the pressures from two separate systems exceed a predetermined differential or the absence of pressure is evidenced by including a piston having one face sensitive to one of the pressures and the opposing face sensitive to the other pressure, and a pair of smaller pistons slidably mounted on connecting shaft of the piston, each having a face adapted to subtract a force from the total force when the pressure acting on one face of the sensing piston is at a predetermined value. The piston is spring loaded in an actuating position when no pressure is acting on the piston.

ERRATUM

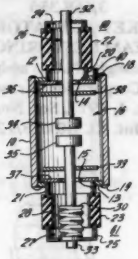
For Class 200—144 see:
Patent No. 3,667,871

3,668,350

VACUUM TYPE CIRCUIT INTERRUPTER

Koichi Takeuchi; Takeo Okada, and Shinichi Aoki, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1969, Ser. No. 808,263
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B 1 Claim



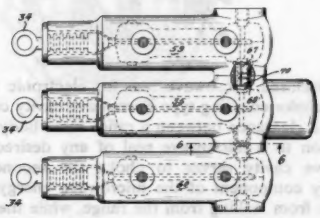
An arc extinguishing chamber confined by a cylindrical housing of stainless steel, and an insulating chamber within a hollow cylindrical insulator communicate with each other and are maintained in a vacuum with two contacts disposed in the arc extinguishing chamber. A pair of apertured separator plates respectively disposed at each end of the housing and another pair of separator plates respectively mounted on each contact rod are formed of stainless steel and prevent the insulating chamber from overheating during exhaustion at a high temperature and also from being contaminated in operation. Two heating devices are used to heat the housing to a higher temperature than the insulating chamber during the exhausting operation.

3,668,351

SECTIONALIZING AND PROTECTIVE APPARATUS FOR SINGLE HOUSE TRANSFORMER

Carl J. Walbrun, and Kenneth Earl Hanke, both of St. Louis County, Mo., assignors to Kearney-National Inc., St. Louis, Mo.

Filed July 30, 1969, Ser. No. 846,187
Int. Cl. H01h *33/00*
U.S. Cl. 200—144 5 Claims



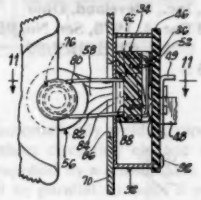
Apparatus for controlling and protecting an electrical power distribution system from failure occurring in or between single dwelling transformers whose primary windings are energized from a sectionalizable loop. The apparatus includes three disconnect switches, one set of contacts in each being permanently connected in electrical series and the outermost ones of the series have their opposite contacts impermanently connected to different sections of the sectionalizable loop, while the intermediate one of the series has its opposite contacts removably connected to one end of a fuse, the opposite end of which connects with the primary of said transformer, whereby the transformer may be isolated without interrupting the continuity of the loop circuit, or a faulty section of the loop between different single dwelling transformers may be isolated and repaired or replaced without deenergizing any transformer energized from the loop.

3,668,352

BLAST ORIFICE UNIT FOR SELF-BLASTING COMPRESSED GAS ELECTRIC CIRCUIT-BREAKERS

Benito Jose Calvino Y. Teijeiro, Bergamo, Italy, assignor to Magrini Fabbriche Riunite Magrini Scarpa e Magnano M.S.M.S.p.A., Milan, Italy

Filed Nov. 25, 1970, Ser. No. 92,671
Claims priority, application Italy, Nov. 27, 1969, 24973 A/69
Int. Cl. H01h *33/70*
U.S. Cl. 200—148 R 7 Claims



An axial blast interruption chamber for self-blasting compressed gas electric circuit-breakers, having a blast orifice unit internally shaped to provide, in the outlet direction, a conical convergent zone; a cylindrical zone having the smallest surface in comparison with the other internal zones, in which a plurality of decompression holes is located, the mouth sections of these holes being parallel to the axis of the interruption chamber; and a substantially conical divergent zone, the divergent zone having a plurality of ring-like grooves, each of which is of substantially triangular cross section with an open base disposed towards the outlet orifice of the interruption chamber; wherein the decompression holes have substantially the shape of oblique truncated cones with their axis slanting in the gas outflow direction; an external shell concentrically surrounding the interruption chamber; and a toroidal groove concentrically disposed in the shell, having a substantially triangular cross section with an open base disposed in the direction of the outlet orifice, the generatrix of the toroidal groove slanting in the gas outflow direction, the outlet sections of the decompression holes opening into the toroidal groove.

3,668,353

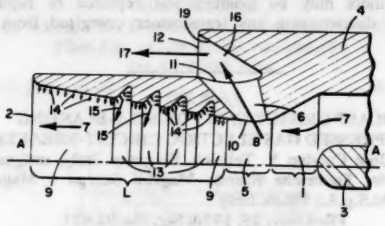
ELECTRICAL SWITCHES WITH EXTERNAL RETURN SPRINGS

Andrew F. Raab, Morton Grove, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.

Filed May 21, 1970, Ser. No. 39,289
Int. Cl. H01h *15/02*
U.S. Cl. 200—153 K 4 Claims

The present invention provides a new switch having a return spring which is mounted outside the casing in which the carriage and contactor are movable. An operating lever or other member extends into the casing to engage the carriage. Preferably, the spring is in the form of a torsion spring mounted on the pivot which supports the lever. In one embodiment, the spring has arms which extend into the casing through an opening therein, and then into a recess in the carriage. When the carriage is moved in opposite directions, it engages and moves the opposite arms of the spring. The op-

posite ends of the opening in the casing provide stops which are engageable with the arms to maintain initial stress in the



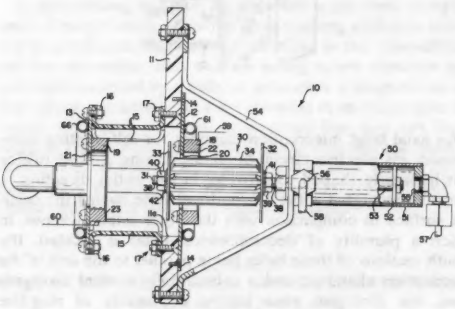
spring. In another embodiment, the arms are engageable by tabs or other elements on the operating lever.

3,668,354

RADIO FREQUENCY TRANSFER SWITCH

Ronald A. Meermans, Strongsville, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Dec. 4, 1970, Ser. No. 95,212
Int. Cl. H01h *3/00*
U.S. Cl. 200—153 S **17 Claims**



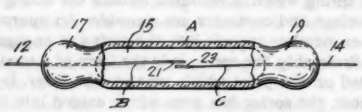
A radio frequency transfer switch is provided which includes a pair of spaced apart annular fixed contact elements and a pair of movable contact discs carried by an axially reciprocable shaft which is fluid motor actuated to move the contact discs into and out of engagement with the fixed annular contacts. The fixed annular contacts are supported by plate means and fluid cooling tube means are disposed against the plate means and in surrounding relationship with respect to the fixed annular contacts.

3,668,355

REED MATERIAL FOR SEALED CONTACT APPLICATION

David Campbell, and Real Oscar Chamberland, Greenfield Park, both of Quebec, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Jan. 27, 1971, Ser. No. 110,153
Int. Cl. H01h *1/02, 1/66*
U.S. Cl. 200—166 C **6 Claims**



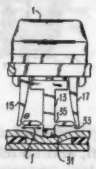
A reed for use in a reed-type switch comprising a body of magnetic material having a contacting surface essentially made up of a precious metal with some of the body material diffused therein, and an interface layer of an alloy of the precious metal and the body material between the body of magnetic material and the precious metal layer. The magnetic material is a glass-compatible nickel-iron alloy containing from about 0.125 to about 0.250 manganese by weight percent and having a resistivity not greater than about 225 ohms per circular mil foot.

3,668,356

MECHANICAL KEY ACTUATOR INCLUDING A CANTILEVER BEAM RESTORING FORCE MEANS

Dennis H. Kekas, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,557
Int. Cl. H01h *3/12*
U.S. Cl. 200—172 A **12 Claims**



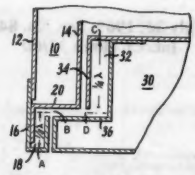
An actuating device having a keytop, base, and an actuator assembly affixed to the base, the assembly including a rod and a cantilever beam arrangement for providing a snap action response to key force and for driving the rod to form an electrical make-break contact, the base and assembly constituting a unitary flexible-tough thermoplastic body.

3,668,357

MICROWAVE SEAL FOR ELECTRONIC RANGE

Kyozo Kobayashi, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1970, Ser. No. 83,162
Claims priority, application Japan, Oct. 23, 1969, 44/100841
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **4 Claims**



The disclosed microwave seal for electronic range comprises a choke coupling type microwave cavity communicating with a clearance between a range main body and a door in addition to a microwave seal of any desired type. The microwave cavity serves to choke the second harmonic frequency component of the microwave energy to prevent the same from leaking from the range, while the microwave seal serves to prevent the basic frequency component of the microwave energy from leaking.

3,668,358

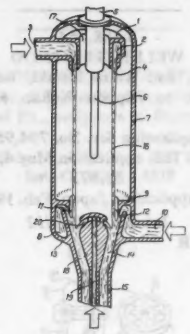
APPARATUS FOR ELECTROMAGNETIC HEATING OF LIQUIDS

Lennart Arvid Stenstrom, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 21, 1970, Ser. No. 39,250
Claims priority, application Sweden, May 27, 1969, 7461/69
Int. Cl. H05b *5/00, 9/06*
U.S. Cl. 219—10.65 **7 Claims**

The liquid to be heated is formed by suitable means into a jet having an annular cross-section and which is free from

contact with any surface; and means are provided for transferring to the annular jet electromagnetic energy uniformly



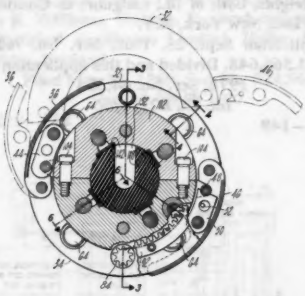
distributed around the periphery of the jet as viewed in said cross-section.

3,668,359

CLAMPING AND WELDING ASSEMBLY

John O. Emmerson, c/o The DSD Company, Bradley Park, West Granby, Conn.

Filed Jan. 29, 1971, Ser. No. 110,930
Int. Cl. B23k *9/02*
U.S. Cl. 219—60 A **11 Claims**



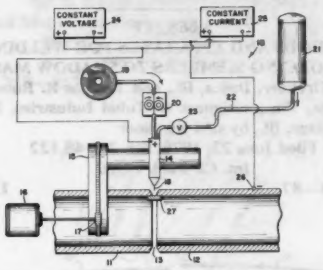
An orbital tube welder is provided comprising a pair of tube clamping assemblies having dual clamping areas and an electrode carrying housing adapted for rotation around the clamping assemblies while applying a closing force thereon. The clamping assemblies advantageously accommodate irregular contours along the length of tubing being welded while assuring precise positioning and secure aligned clamping thereof during the welding operation by utilizing clamping jaws adjacent the weld and a spaced resilient aligning and clamping collar having a radial slot extending along the length thereof. Multiple adjustments are incorporated in both the housing and the individual clamping assemblies for precisely controlling alignment of the tubes being welded.

3,668,360

AUTOMATIC PIPELINE WELDING METHOD

William L. Ballis, 661 Leap Road, Hilliard, Ohio

Continuation-in-part of application Ser. No. 18,370, Mar. 12, 1970, now abandoned , and a continuation of 704,437, Feb. 9, 1968, now abandoned. This application Feb. 24, 1971, Ser. No. 118,449
Int. Cl. B23k *31/06*
U.S. Cl. 219—61 **11 Claims**



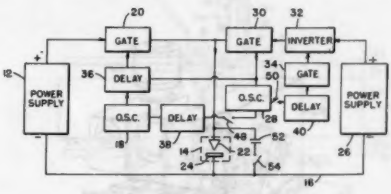
The method for automatically welding pipelines by means of a gas shielded short circuiting electric arc is disclosed wherein the arc is supplied by a consumable metal electrode which is connected in parallel to both a constant voltage power source and a constant current power source. A solid non-consumable metal backup plate is positioned against the root opening of the weld joint, an arc is established between the electrode and the pipeline and the electrode is moved along the circumference of the pipeline in proximity to the weld joint. The electrode is supplied to the joint at a constant feed rate selected from the range of between 350 and 1,000 inches per minute during each of a stringer bead pass, one or more filler passes, and a cap pass of the electrode about the circumference of the pipeline. During each of the passes the current supplied to the electrode by the constant current source is selected in accordance with the feed rate in order to maintain the current supplied by the constant voltage source, and thus the arc force, below a predetermined level for each selected feed rate while maintaining a short circuiting type welding operation.

3,668,361

STRUCTURE FOR AND METHOD OF ELECTRO EROSION MACHINING

Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich.

Filed Apr. 30, 1970, Ser. No. 33,217
Int. Cl. B23k *9/16*
U.S. Cl. 219—69 C **5 Claims**



A high voltage, low current electric signal is placed across the electrode and workpiece in an electro erosion machining circuit in accordance with the disclosure to provide improved machining. The high voltage, low current signal may be continuous or pulsed and if pulsed, it may be initiated by intermittent low voltage, high current electro erosion machining

pulses or independent therefrom. The high voltage, low current signals, if pulsed, may also be initiated prior to, at the same time as or subsequent to the low voltage, high current electro machining pulses and may be of the same or opposite polarity. If the high voltage, low current signal is pulsed, the frequency and pulse width may be varied. A capacitor may be selectively placed across the electrode and workpiece during electro erosion machining in conjunction with the high voltage, low current signal to further improve the machining characteristics of the low voltage, high current electro erosion machining signal.

3,668,362

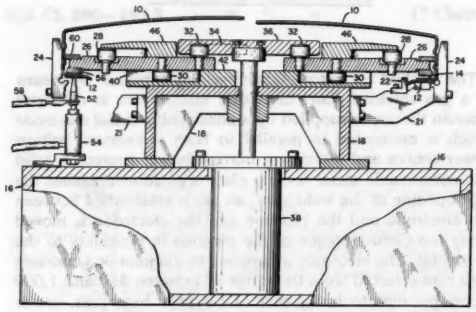
METHODS AND APPARATUS FOR WELDING REINFORCING MEMBERS TO SHADOW MASKS

Myron C. Kirchner, Itasca, Ill., and Thomas R. Rosenberger, Milwaukee, Wis., assignors to Tubal Industries, Inc., Elk Grove Village, Ill., by said Kirchner

Filed June 22, 1970, Ser. No. 48,132

Int. Cl. B23k *11/10*

U.S. Cl. 219—87 **12 Claims**



A method and apparatus for welding reinforcing members to color television shadow masks. Eight internal supporting blocks are positioned by a rotary cam to support the inside concave surface of the mask while welding electrodes press and weld a reinforcing ring to the shadow mask from the outside.

3,668,363

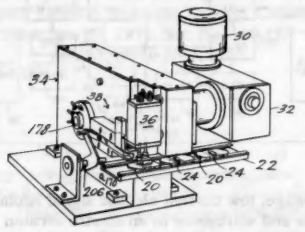
APPARATUS FOR WELDING PARTS TO WORKPIECES

Don E. Ehrlich, Avon, Ohio, assignor to TRW Inc., Cleveland, Ohio

Original application Jan. 26, 1970, Ser. No. 563,914, now Patent No. 3,557,338. Divided and this application Jan. 26, 1970, Ser. No. 10,705

Int. Cl. B23k *9/20, 9/22*

U.S. Cl. 219—98 **1 Claim**



Apparatus is provided for welding parts to workpieces at a high rate in the order of 250–300 parts per minute. The apparatus includes an arrangement for supplying the parts to the chuck of the welding tool and a mechanical arrangement for co-ordinating the operation of the tool and the part supply. The entire operation of the tool is controlled mechanically including mechanical means for timing the pilot ad welding arcs of the welding cycle.

3,668,364

WELDING METHOD

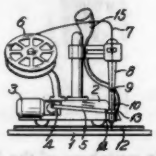
Hirokazu Nomura, and Akira Sasaki, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of application Ser. No. 794,957, Jan. 29, 1969, now abandoned. This application May 4, 1970, Ser. No. 31,873

Claims priority, application Japan, Feb. 19, 1968, 43/10094

Int. Cl. B23k *9/12*

U.S. Cl. 219—125 R **2 Claims**



A welding method used in electric arc welding wherein a consumable wire core electrode is fed by a nozzle onto a workpiece at a welding station. The nozzle moves relative to the workpiece at a changeable speed including intermittent motion so as to provided an agitating action to the weld metal, the intermittent motion being in the form of oscillations at between 0.2 to 4 Hz and small amplitude along the direction of the weld seam.

3,668,365

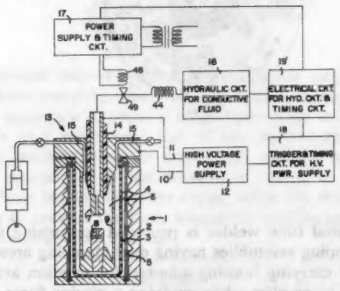
PULSED LIQUID WIRE ELECTROHYDRAULIC SYSTEM

Robert W. Norin, Country Club Hills, and Donald J. Roth, Chicago Heights, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Original application Sept. 25, 1968, Ser. No. 762,457, now Patent No. 3,566,648. Divided and this application Aug. 17, 1970, Ser. No. 64,394

Int. Cl. B21j *1/06*

U.S. Cl. 219—149 **4 Claims**


POWER SUPPLY & TIMING CKT.
HYDRAULIC CKT. FOR CONDUCTIVE FLUID
ELECTRICAL CKT. FOR HYD. CKT. & TIMING CKT.
HIGH VOLTAGE POWER SUPPLY
TRIGGER & TIMING CKT. FOR H.V. PWR. SUPPLY

An electrohydraulic container forming device wherein a thin stream of conductive fluid constitutes a bridge between one electrode and the other of the shock producing electrodes. The conductive liquid is pressurized to a higher value than the internal pressure of the container. In operation the conductive liquid is emitted under pressure from one electrode by a timing circuit driving a shear type solenoid valve.

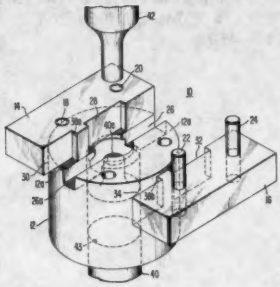
A second timing circuit synchronizes the electrical discharge with the establishment of a preferentially conductive bridge across the electrode gap. A sharp jet pulse is given off from the arc thus established and this develops pressure inside the rubber diaphragm to press it against the container which is then pressed into the interstices of the die to give a fully stylized container.

3,668,366

RESISTANCE WELDING APPARATUS

Johannes F. Gerber, King of Prussia, and Rudolph A. Cola, Malvern, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 17, 1971, Ser. No. 116,156
Int. Cl. B21j *13/08*
U.S. Cl. 219—158 **3 Claims**



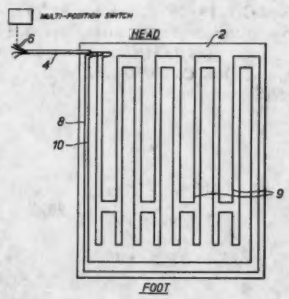
A welding apparatus which permits accurate spacing of workpieces, and eliminates arcing of the welding current and contamination of the workpieces.

3,668,367

ELECTRICALLY HEATED PADS OR BLANKETS

Frederick R. Williams, Woking, England, assignor to Dreamland Electrical Appliances Limited, Hythe, Southampton, Hampshire, England

Filed May 15, 1969, Ser. No. 824,962
Int. Cl. H05b *1/00*
U.S. Cl. 219—212 **3 Claims**



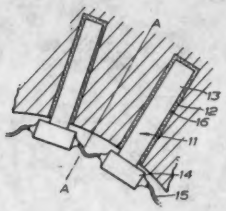
An electrically heated pad or blanket having two heating elements defining two separate electrical circuits, each circuit being connected to a multi-position switch so that they can be connected to a supply of electricity in series or parallel or selectively one at a time, one of the heating elements being longer than the other and having the greater length part disposed in a region not containing the runs of the shorter element so that when placed in parallel there is an even heat distribution over the pad or blanket, when placed in series there is an even heat distribution of less heat and when only one circuit is connected to the supply one area of the pad or blanket is heated at a different temperature to the remaining area of the pad or blanket.

3,668,368

A PROCESS AND APPARATUS FOR THE PREVENTION OF ICE FORMATION IN TUNNELS

Oddmund Moldskred, Brakehaugen, 5050 Nesttun, Norway

Filed Dec. 7, 1970, Ser. No. 95,452
Int. Cl. H05b *3/00*
U.S. Cl. 219—213 **27 Claims**



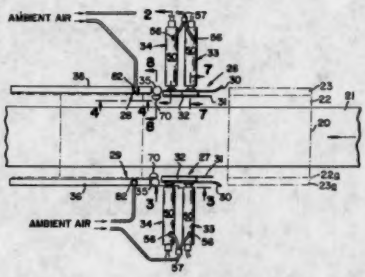
Processes and devices for the prevention of ice formation in tunnels, especially road and railway tunnels, mountain cuttings and the like, by the supply of heat from the outside to rock faces where the formation of ice normally occurs. More particularly, this involves installing electrical heating means distributed in a self-supporting manner in individual bores formed in a rock face substantially at right angles to a boundary surface with the air and heating a layer of rock between the air and rear-lying masses of rock to a temperature higher than the temperature at said boundary surface and lower than the temperature of said rear-lying rock masses.

3,668,369

HEAT SEALING APPARATUS FOR CLOSURE OF PAPERBOARD PACKAGE FLAPS

William J. Howe, Los Altos, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Original application Feb. 3, 1969, Ser. No. 795,786, now abandoned, which is a continuation-in-part of application Ser. No. 696,794, Jan. 10, 1968, now abandoned. Divided and this application June 2, 1970, Ser. No. 54,079
Int. Cl. H05b *1/00*
U.S. Cl. 219—243 **11 Claims**



Apparatus for heat-sealing paperboard package closure flaps having a heat sealable coating. While the package

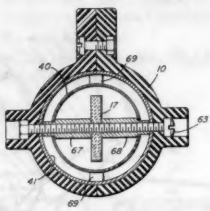
moves, two flaps are brought into proximity along two planes diverging at an acute angle, and upon the facing flap surfaces, are impinged one or more high-volume, low-velocity streams of very hot air, each along a controlled narrow area to heat one or more critical strips of each flap above the heat-sealing temperature.

3,668,370

PORTABLE ELECTRIC HEAT GUN

Richard Arthur Pattison, Burlington, Mass., assignor to Electronized Chemicals Corporation, Burlington, Mass.

Filed Nov. 6, 1969, Ser. No. 874,577
Int. Cl. F24h *3/04*; H05b *3/02*
U.S. Cl. 219—373 **5 Claims**



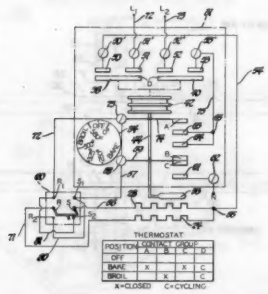
A portable heat gun especially applicable for shrinking of heat-shrinkable polyethylene tubings. A brushless self-lubricating electric motor is positioned within a hollow pistol grip shaped housing of high impact plastic, in line with an air intake orifice in the rear of the housing. The motor carries a fan to push intake air past a heating wire wound round a stiff, flat, refractory card maintained within the inner stainless steel tube of the two co-axial tubes set in the housing and giving the heat gun the appearance of a pistol, and then through an exhaust orifice. The tubes and card are held in place by a set of screws and by associated spacer elements. Air may be passed between the tubes to provide thermal insulation. A three-way switch permits fan operation with or without heating. Support means on the housing cooperate with the handle to provide a tripod support for holding the tubes vertical.

3,668,371

CIRCUIT ARRANGEMENT FOR ACCELERATED CONTINUOUS CLEANING OF SELF CLEANING OVEN COATINGS

Millard E. Fry, and Robert D. Bremer, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 16, 1971, Ser. No. 153,727
Int. Cl. F27d *11/00*
U.S. Cl. 219—413 **3 Claims**



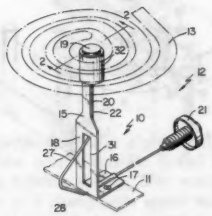
A circuit arrangement for a continuously cleaning coated oven at an elevated temperature range above the normal operating range but not in excess of that allowed for non-locked oven operation so as to improve the thermal cleaning of the oven bottom wall coating. The arrangement includes a separate manually settable control switch having a Cook position for energizing the bake and broil elements in a conventional manner and a Clean position wherein the broil element is disconnected and the bake element is energized while maintaining the thermostatic condition for broil operation such that the oven will continuously self-clean by heating the oven bottom wall much hotter than the existing oven air temperature.

3,668,372

TEMPERATURE SENSING DEVICE AND APPARATUS UTILIZING THE SAME

William H. Russell, Malvern, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 6, 1971, Ser. No. 131,672
Int. Cl. H05b *3/68*
U.S. Cl. 219—450 **20 Claims**



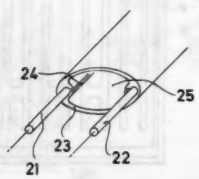
A temperature sensing device for sensing the temperature of a cooking vessel disposed on the heating means of a cooking apparatus comprising a bracket secured to the cooking apparatus and movably carrying a sensing element that contacts the bottom of the cooking vessel, the sensing element having a capillary tube interconnected thereto and having a single bend therein that provides the sole means for urging the sensing element into contact with the bottom of the cooking vessel.

3,668,373

EXCESS TEMPERATURE SWITCHING DEVICE

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen bei Stuttgart, Germany

Filed Oct. 19, 1970, Ser. No. 81,797
Claims priority, application Austria, Nov. 4, 1969, A 10334/69
Int. Cl. H05b *1/02*
U.S. Cl. 219—505 **2 Claims**



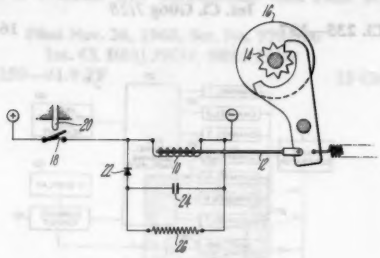
A temperature switching device for interrupting an electric circuit above or below a per-set temperature value having a temperature sensor formed as a hollow body containing two manually insolated conductors and a substance which undergoes a large change of resistivity at a well-defined temperature.

3,668,374

DRIVE CIRCUIT FOR PULSED INDUCTIVE WINDINGS

John G. Gamble, Simsbury, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed July 29, 1970, Ser. No. 59,190
Int. Cl. G06m 1/04
U.S. Cl. 235—92 C 4 Claims



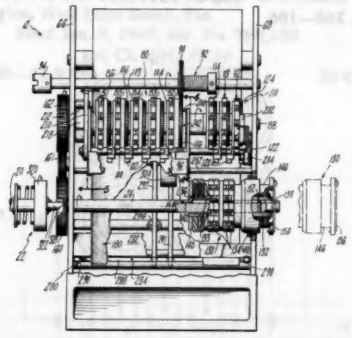
A pulse forming drive circuit for a high speed counter actuated by a solenoid wherein a pulsing switch controls the energization of the solenoid. The drive circuit is connected in parallel with the solenoid and includes a capacitor and a resistor each connected across the solenoid and a rectifier connected in series with the capacitor and resistor to prevent the flow of current therethrough when the pulsing switch is closed but allows the flow of current therethrough when the magnetic switch is open to delay the normal voltage spike and then use the delayed voltage spike to promote the rapid decay of the magnetic field energy of the solenoid.

3,668,375

PRINTER

Bruno S. Smilgys, Hartford, Conn., and Robert C. Ritchie, Feeding Hill, Mass., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Oct. 13, 1970, Ser. No. 80,260
Int. Cl. B67d 5/22
U.S. Cl. 235—94 R 8 Claims



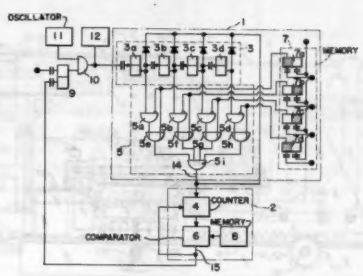
A gasoline pump printer having a cost printing counter, a serial printing counter, and a date printer and operable at the end of each gasoline delivery for printing a record of the delivery. A printer operating shaft is connected to rotate the supporting shafts of the cost and serial counters and date printer one full revolution to (a) rotate the print wheels to perform a printout, (b) reset the cost counter print wheels to "0," and (c) index the serial counter for printing the next serial count, and to operate a shearing mechanism for shearing the printed delivery record from a paper roll.

3,668,376

FEED CONTROL DEVICE FOR A PHOTOGRAPHIC TYPESETTER

Tomoji Murata, Sakai, and Toshiaki Ishihara, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha

Filed Sept. 16, 1970, Ser. No. 72,668
Claims priority, application Japan, Sept. 16, 1969, 44/73457
Int. Cl. G06f 15/46, 7/39
U.S. Cl. 235—151.22 2 Claims



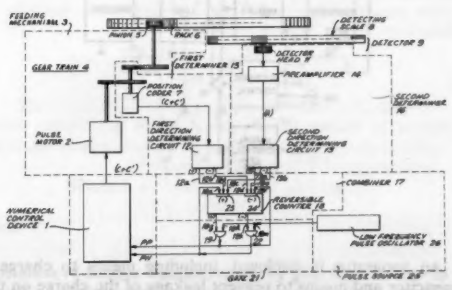
First and second comparing circuits each include respective first and second counter circuits wherein pulses generated by a pulse generator are initially compared by the first comparator with a stored number representing the width of a character to be photographed. In response to an output from the first comparator indicating coincidence with the stored number therein, the second comparator counts pulses from the pulse generator until coincidence with a stored digital factor representing the type size of the character to be photographed. An output signal from the second comparator is fed back to stop the pulse generating device.

3,668,377

NUMERICAL CONTROL SYSTEM FOR ELIMINATING PITCH ERROR AND BACKLASH OF THE FEEDING MECHANISM

Seluemon Inaba, Kawasaki-shi; Kanryo Shimizu, Tokyo, and Yoshihiro Hashimoto, Yokohama-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 2, 1969, Ser. No. 821,260
Claims priority, application Japan, May 8, 1968, 43/30740
Int. Cl. G06f 15/46; G05b 19/18
U.S. Cl. 235—151.11 6 Claims



A numerical control system eliminates error in a feeding mechanism for a movable machine by combining an indica-

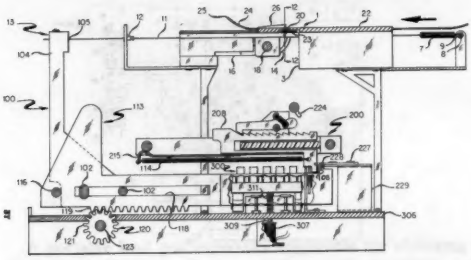
tion of the magnitude of an input fed by the feeding mechanism to the machine with an indication of the magnitude of movement of the machine and controlling the supply of a compensating pulse to the feeding mechanism in accordance with a difference between such indications.

3,668,378

REGISTERING APPARATUS

Eugene E. Reynolds, Orangeburg, S.C., assignor to SCM Corporation

Filed Mar. 24, 1969, Ser. No. 809,694
Int. Cl. G06f 5/02
U.S. Cl. 235—155 **11 Claims**



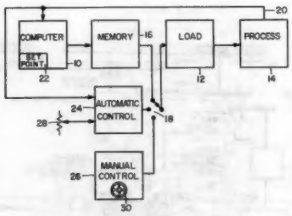
The invention relates to a mechanism for printing values entered in a keyboard or transmitted from a computer. Normally, values entered in a keyboard are entered in the decimal system of notation and values received from a computer or other external source are transmitted in a binary code. With this thought in mind, this invention provides a mechanism for receiving information from either an internal keyboard in decimal values or from an external source in binary coded values, entering said values serially into a storage and printing out said values in parallel.

3,668,379

INTERFACE APPARATUS FOR COMPUTER INCLUDING AN INTEGRATOR CIRCUIT WHICH OPERATES TO PERMIT TRANSFER BETWEEN AUTOMATIC AND MANUAL CONTROL

Steven L. Roberts, Amherst, N.H., and Edward J. Miller, Jr., Tempe, Ariz., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1969, Ser. No. 868,155
Int. Cl. G06g 7/18
U.S. Cl. 235—183 **10 Claims**



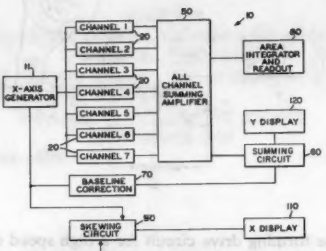
An apparatus is disclosed, including means to charge a capacitor and means to prevent leakage of the charge on the capacitor, to cause proper transfer of control, of the position of a tool or to change a step of a process, from a computer to a manual or automatic controller and in the reverse direction. The apparatus includes an integrator circuit which can be converted by proper manipulation of switches into a voltage following circuit.

3,668,380

COMPOSITE CURVE ANALYZER

William E. Claxton, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 14, 1969, Ser. No. 866,263
Int. Cl. G06g 7/28
U.S. Cl. 235—197 **16 Claims**



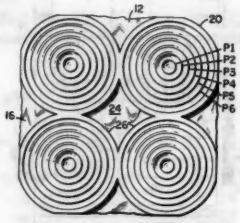
A special purpose analog computer is provided to resolve and display a plurality of peaks from a composite curve. The peaks may selectively be either Gaussian or Lorentzian in form. Peak position, width and amplitude are independently controlled. Baseline slope and skewing can also be provided, as necessary, to fit the composite curve. The output of the device can be displayed on an oscilloscope and can be sent to an area readout system so that percent areas of each component curve can be ascertained. Further, if desired, the integral curve of any component or combination of components can be easily displayed.

3,668,381

PRISMATIC LIGHT LOUVER

Robert A. D. Schwartz, 513 Independent Road, Oakland, Calif., and Rodney P. Osterberg, 7632 Surrey Lane, Oakland, Calif.

Filed Feb. 2, 1970, Ser. No. 7,950
Int. Cl. F21v 5/00
U.S. Cl. 240—106 **12 Claims**



A light transmitting louver for use as a ceiling panel in a luminous ceiling or as a lens in a lighting fixture. The louver has a planar member adapted to be positioned adjacent a light source and a plurality of walls extending from the member on the side opposite the light source to define a symmetrical closed cell system. Within the peripheral extent of each cell and on a surface of the planar member are prisms which extend generally symmetrical to the cell axis and with the cell wall. The individual prisms are asymmetrical in cross-

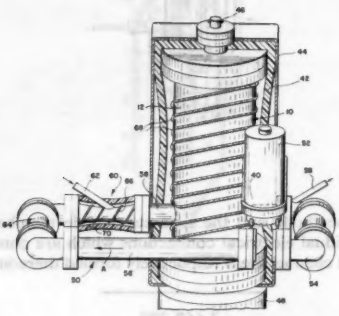
section, i.e., the angular slope of the respective surfaces of each prism is different.

3,668,382

SEPARATION AND DETECTION OF TRACE SUBSTANCES IN GASEOUS SAMPLES CONTAINING MOISTURE BY DILUTING WITH DRY AIR

Martin J. Cohen, West Palm Beach; Roger F. Wernlund, Lake Worth, and David I. Carroll, Lantana, all of Fla., assignors to Franklin Gno Corporation, West Palm Beach, Fla.

Filed Nov. 26, 1968, Ser. No. 779,096
Int. Cl. H01j *39/34;* B01d *59/44*
U.S. Cl. 250—41.9 TF **15 Claims**



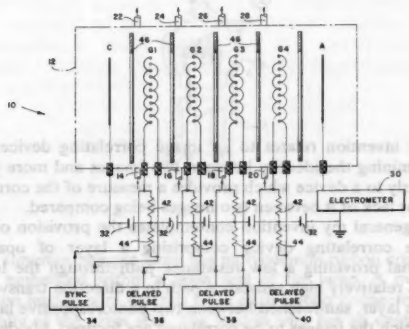
Apparatus and methods for sorting and detecting trace gases which undergo ion-molecule reactions and for reducing the deleterious effects of moisture upon the measurements. Positive or negative ions of the trace gas are formed by ion-molecule reactions between molecules of the trace gas and primary ions from another gas. Ions are classified in accordance with their velocity in an electric drift field. The effects of moisture in the sample are significantly reduced by diluting the sample with dry air, which is recirculated after treatment.

3,668,383

APPARATUS AND METHODS FOR SEPARATING, DETECTING, AND MEASURING TRACE GASES

David I. Carroll, Lantana, Fla., assignor to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Jan. 9, 1969, Ser. No. 790,108
Int. Cl. H01j *39/36*
U.S. Cl. 250—41.9 TF **28 Claims**



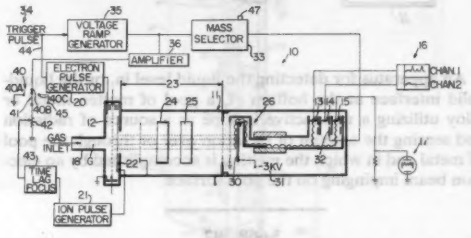
Apparatus and methods for sorting and detecting trace gases which undergo ion-molecule reactions. Reactant ions and product ions may be sorted in accordance with their velocity in an electric field at different regions of a drift cell, and multiple ion-molecule reaction regions may be provided. Different regions of the cell may be supplied with different gaseous media.

3,668,384

MASS SPECTROMETER

Charles J. Moorman, and Richard H. Lehman, both of Cincinnati, Ohio, assignors to The Bendix Corporation

Filed Apr. 1, 1969, Ser. No. 812,237
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 TF **1 Claim**



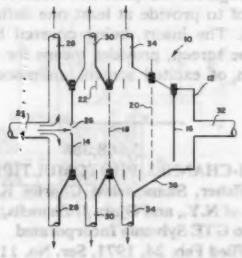
A mass spectrometer having means operatively connecting a circuit which provides a time lag between each ionizing electron pulse and each ion accelerating pulse to a delay circuit in an output scanner comprising the spectrometer so that each mass in the spectrum which is under observation will always be in best focus.

3,668,385

APPARATUS AND METHODS FOR IMPROVING MEASUREMENTS PERFORMED UPON GASEOUS SAMPLES BY REDUCING SAMPLE CONTAMINATION

Martin J. Cohen, West Palm Beach, Fla., assignor to Franklin Gno Corporation, West Palm Beach, Fla.

Filed Oct. 13, 1969, Ser. No. 865,738
Int. Cl. H01j *39/34;* B01d *59/44*
U.S. Cl. 250—41.9 TF **17 Claims**



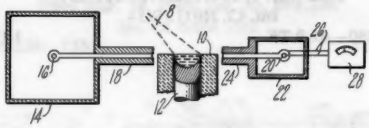
Variation of sample concentration, by gain from or loss to the wall of a measurement chamber or sample inlet pipe, is avoided by extracting the central gas core of a streamline sample flow. Measurements are performed upon trace sample components by drift cell techniques.

3,668,386

APPARATUS FOR MEASUIRNG HEIGHT OF A MOLTEN METAL POOL

Sol S. Blecherman, Newington; Nicholas E. Ulion, Vernon, and Louis L. Packer, Hazardville, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 13, 1969, Ser. No. 806,953
Int. Cl. G01t 1/17; G01n 23/10
U.S. Cl. 250—43.5 FL **3 Claims**



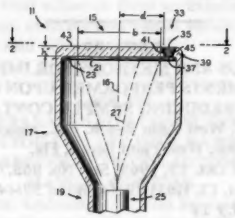
An apparatus for detecting the liquid level in, or the liquid-solid interface at the bottom of, a pool of molten metal or alloy utilizing a radioactive isotope as a source of radiation and sensing the amount of radiation over or through the pool of metal and in which the melting is accomplished by an electron beam impinging on the pool surface.

3,668,387

CATHODE RAY TUBE FACEPLATE HAVING DIVERSE OPTICAL MEANS THEREIN

Alfred D. Johnson, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Filed May 4, 1970, Ser. No. 34,023
Int. Cl. H01j 29/10, 29/89, 5/16
U.S. Cl. 313—92 R **3 Claims**



A cathode ray tube having a faceplate panel wherein at least one optical insert of low-attenuation optical material is disposed through the faceplate in substantially the peripheral region thereof to provide at least one defined light channel therethrough. The insert, being covered by the peripheral portion of the screen, provides means for channeling a discrete portion of excited screen luminescence through the faceplate.

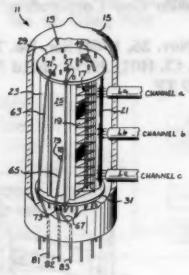
3,668,388

MULTI-CHANNEL PHOTOMULTIPLIER TUBE

Mahlon B. Fisher, Skaneateles; Charles K. Schiller, Seneca Falls, both of N.Y., and Ojars J. Ziemelis, Sunnyvale, Calif., assignors to GTE Sylvania Incorporated

Filed Feb. 24, 1971, Ser. No. 118,458
Int. Cl. H01j 31/50
U.S. Cl. 313—95 **12 Claims**

The improved photomultiplier tube utilizes a multi-channel structure within a common envelope. A photocathode and a plurality of dynode members each have barrier means associated therewith to effect a plurality of related-area elements on each member providing a plurality of separate photomultiplier channel areas thereon. The anode structure has a separate anode element for each individual channel with a separate electrical connection extending therefrom.



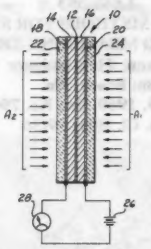
The photocathode and the separate dynode members each have individual electrical connections which are common to the related channel areas respectively formed thereon.

3,668,389

PHOTOSENSITIVE DEVICE COMPRISING PHOTOCONDUCTIVE AND PHOTOVOLTAIC LAYERS

Thomas D. Kegelman, Ridgefield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 19, 1969, Ser. No. 859,540
Int. Cl. H01j 39/00, 39/06
U.S. Cl. 313—96 **1 Claim**



My invention relates to an image correlating device for determining the identity between two images and more particularly to a device which provides a measure of the correlation or lack of it between two images being compared.

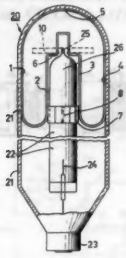
In general my invention contemplates the provision of an image correlating device comprising a layer of opaque material providing a low resistance path through the layer and a relatively high resistance path in a direction transverse of the layer, sandwiched between two photoresponsive layers on which the images to be correlated are focused. My device provides an output current which is a measure of the correlation between the images.

3,668,390

GAS AND/OR VAPOR DISCHARGE LAMP HAVING A U-SHAPED DISCHARGE TUBE

Urbaan Paul Marguerite Goossens, Waasmunster, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 18, 1971, Ser. No. 116,435
Claims priority, application Germany, Feb. 25, 1970, G 70 06 868.7
Int. Cl. H01j *61/34*
U.S. Cl. 313—220 4 Claims



The invention relates to the concentration of a U-shaped discharge tube in an outer envelope namely at the bend of this tube.

The invention provides a centering member which includes a rectangular support of leaf spring, the inner wall of this support closely surrounding the two legs of the discharge tube.

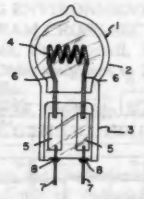
When using the invention the risk of cracking of the discharge tube is only small. FIG. 2.

3,668,391

TUNGSTEN HALOGEN LAMP HAVING IMPROVED SEAL OF MOLYBDENUM ALUMINIDE

Stephen F. Kimball, Beverly, Mass., assignor to Sylvania Electric Products Inc.

Filed Aug. 19, 1970, Ser. No. 65,076
Int. Cl. H01j *5/48*
U.S. Cl. 313—318 10 Claims



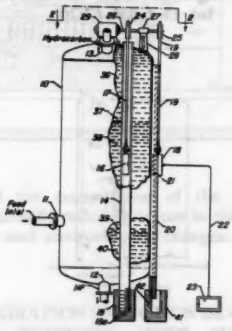
A tungsten halogen lamp has molybdenum ribbon connectors embedded within a press seal of the lamp. A molybdenum lead-in wire extends from each ribbon connector externally of the press seal. The lead-in wire has an oxidation resistant molybdenum aluminide coating thereon. A bead of soft glass seals the opening in the press seal caused by the lead-in wire.

3,668,392

RADIOACTIVE RADIATION-TYPE FLUID INTERFACE DETECTION SYSTEM

Walter A. Bajek, Lombard, and David M. Boyd, Jr., Clarendon Hills, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation of application Ser. No. 454,519, May 10, 1965, now abandoned. This application May 20, 1969, Ser. No. 827,122
Int. Cl. G01n *23/10*
U.S. Cl. 250—43.5 D 13 Claims



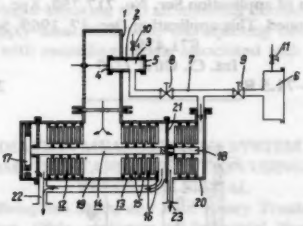
Method and apparatus for locating one or more liquid-liquid interfaces within a closed vessel utilizing a radiation-type interface detector. A traveling radiation source within the vessel and a traveling radiation detector outside the vessel, the paths of travel of both being vertical and the speed of both being synchronized, are used to provide constant path length therebetween. The instrument output is in the nature of a density profile.

3,668,393

APPARATUS HAVING EVACUATION SPACES AND A PUMPING ASSEMBLY

Moriz Von Rauch, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 28, 1970, Ser. No. 75,883
Claims priority, application Germany, Sept. 30, 1969, P 19 50 328.7
Int. Cl. H01j *37/26;* F03b *5/00;* F01d *3/02*
U.S. Cl. 250—49.5 A 5 Claims



An apparatus has a high vacuum seal and at least one additional evacuative space as well as a pumping assembly for evacuating the vessel and space. The pumping assembly has a backing pump and a turbomolecular pump having a main section communicating with the vessel and with the backing pump. The turbomolecular pump has an auxiliary section communicating with the additional evacuative space and has

a housing enclosing the main and auxiliary sections. The turbomolecular pump has first and second pump members disposed in the main and auxiliary sections respectively. The housing includes a wall intermediate the main and auxiliary sections for separating the sections in vacuum tight relation to each other. The turbomolecular pump has a rotor shaft which passes through the wall and connects the first pump member with the second pump member.

3,668,394

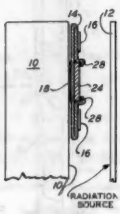
X-RAY FILM IDENTIFICATION MEANS

Norman Panzer, 71 Blanchard Rd., South Orange, N.J.

Filed Aug. 3, 1970, Ser. No. 60,311

Int. Cl. G03b *17/26*

U.S. Cl. 250—67 **4 Claims**



Means for contrastingly projecting X-rays for identification purposes upon an X-ray film carried by a cassette include, at the front face of the cassette (the side facing the radiation source), an indicia sheet of X-ray opaque material form which a plurality of identifying characters have been punched out, and imperforate X-ray absorbent sheet material interposed between said indicia sheet and the radiation source for attenuating the radiation beam passing to said indicia sheet. The indicia sheet and the imperforate sheet material, which are arranged to be subjected to X-rays simultaneously with the imposing of such radiation upon the person or thing to be identified, may be varied in their relative opacities and in their cumulative opacity, depending upon the radiation strength and the X-ray absorption characteristic of the subject being photographed. Said indicia sheet and imperforate sheet material are advantageously separably associated with a suitable indicia carrier.

3,668,395

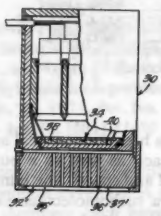
SCINTILLATION CAMERA HAVING IMPROVED PERIPHERAL RESPONSE

William G. Walker, Schiller Park, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Continuation of application Ser. No. 717,750, Apr. 1, 1968, now abandoned. This application Dec. 17, 1969, Ser. No. 871,479

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 R **21 Claims**



A substantial increase in the diameter of the useable light image generated by a scintillation camera equipped with a multiple collimator is achieved by using a collimator that does not include holes which allow radiation to strike the periphery of the scintillator.

3,668,396

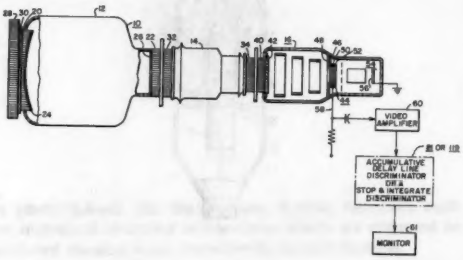
TELEVISION TYPE NUCLEAR RADIATION CAMERA SYSTEM

Juris A. Asars, Monroeville, and Robert J. Schneeberger, Pittsburgh, both of Pa., assignors to CGR Medical Corporation, Cheverly, Md.

Filed Nov. 10, 1969, Ser. No. 875,348

Int. Cl. H04n *3/00*

U.S. Cl. 250—83.3 R **5 Claims**



A television type camera system in which TV type scanning is used for readout of a spatially distributed nuclear radiation image. The scanning system provides means of time integration of the video pulses derived from a single radiation event and provides discrimination of the integrated pulses generated by a single event in the spatially distributed image. In one embodiment of the invention, conventional TV scanning is utilized and circuitry is associated with the system to permit time integration of the multiple video pulses derived from a single event for subsequent discrimination. A second embodiment utilizes a non-conventional scanning system to permit the electron scanning beam to stop and integrate a single event and subsequent discrimination of the signal.

3,668,397

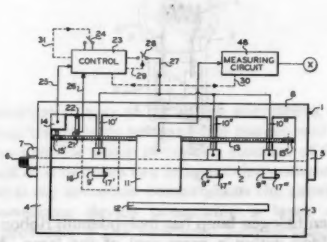
MEASURING SYSTEM SUPPORT

Duane L. Stucky; Richard G. Donaldson, and Allen D. Alexander, all of Columbus, Ohio, assignors to Industrial Nucleonics Corporation

Filed Feb. 16, 1971, Ser. No. 115,200

Int. Cl. G01t *1/16*

U.S. Cl. 250—83.3 D **5 Claims**



The present invention in one form provides an arrangement for support standardization a measuring system. The measuring system comprises a measuring device that is supported by one or more tubes held under tension in a frame.

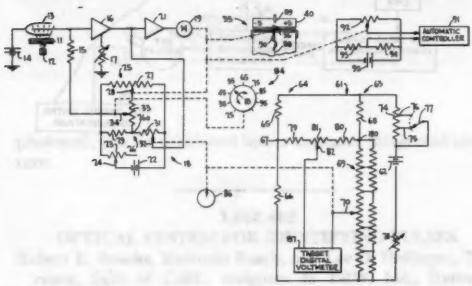
The tubes are clamped to the frame while the device is measuring and unclamped to allow the tube to resume a free position. The clamps support the tubes in the free position, when the clamps are reclamped. Changes in the frame dimensions, due to thermal effects are compensated for, retaining the position of the measuring device relative to the material being measured substantially constant, for more accurate and reproducible measurements.

3,668,398

SYSTEM AND METHOD FOR FACILITATING THE OPERATING SET-UP OF A RADIATION GAUGE

George I. Doering, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Dec. 26, 1968, Ser. No. 787,157
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 D **18 Claims**



Disclosed are a system and method for facilitating the setup of a nucleonic gauge and automatic controller for measuring and controlling the thickness of a material. The gauge includes conventional calibration circuits having variable voltage dividers set in accordance with the expected operating points for the material thickness center scale and gauge sensitivity. In one embodiment, the sensitivity and operating point voltage dividers as well as the automatic controller setpoint voltage divider are set with the aid of an auxiliary bridge including additional voltage dividers ganged with the voltage dividers of the gauge calibration circuits. In another embodiment, one of the auxiliary bridge voltage dividers has a logarithmic response, enabling calibration for different materials to be established by changing the input voltage to the auxiliary bridge.

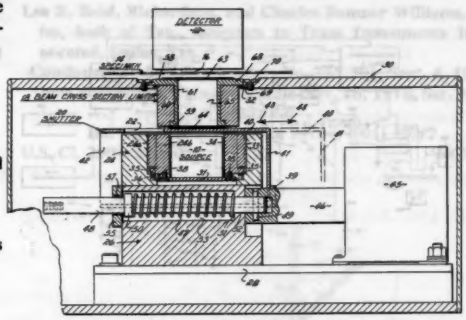
3,668,399

GAUGE USING ENVIRONMENT-INSENSITIVE RADIATION BEAM CROSS-SECTION LIMITER

Bonaventure B. Cahill, Ft. Mitchell, Ky., and Wilfred W. Lyon, Cincinnati, Ohio, assignors to The Ohmart Corporation, Cincinnati, Ohio

Filed June 30, 1969, Ser. No. 837,681
Int. Cl. G21f 5/02; H01j 35/16
U.S. Cl. 250—83.3 D **12 Claims**

Gauge for measuring the characteristics of a specimen including a shielded source of radiation, a detector spaced from said source, a radiation beam cross-section limiter through which radiation from the source passes as it travels along a path for impingement upon the specimen which is located in a gap between the limiter and the source for selectively blocking and unblocking radiation from the source. The radiation beam cross-section limiter includes a bore sealed at both ends through which the radiation from the source passes in its path to the specimen and detector. By virtue of the sealed beam-limiting bore the mass of material contained within the bore, which usually is air, remains constant independent of changes in the environment, such as changes in environmental temperature, barometric pressure,



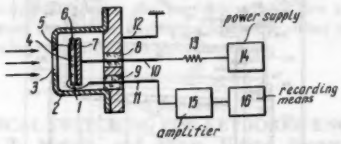
humidity and the composition of the surrounding gas, thereby substantially reducing errors in the gauging process introduced by such environmental changes.

3,668,400

NUCLEAR RADIATION DETECTION DEVICE UTILIZING DIAMOND DETECTOR WITH INJECTING AND BLOCKING CONTACTS

Stanislav Fedorovich Kozlov, B. Akademicheskaya ulitsa, 49, korpus I, kv. 18, Moscow, U.S.S.R.

Filed Sept. 10, 1969, Ser. No. 856,606
Claims priority, application U.S.S.R., Sept. 11, 1968, 1269669
Int. Cl. G01t 1/24
U.S. Cl. 250—83.3 R **1 Claim**



A device for detecting nuclear radiations, comprising a nuclear radiation detector on the basis of a diamond crystal plate, having a blocking and an injecting contacts, a detector power supply associated with the injecting contact, and an amplifier with recording means associated with the blocking contact.

3,668,401

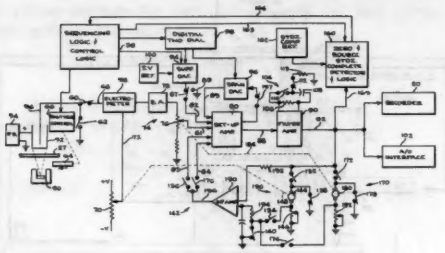
RADIATION MEASUREMENT SYSTEM WITH AUTOMATIC STANDARDIZATION USING A RATE FEEDBACK SIGNAL

Franklin Bong-See Shah, and Paul Henry Troutman, both of Columbus, Ohio, assignors to Industrial Nucleonics Corporation

Filed Mar. 11, 1970, Ser. No. 18,541
Int. Cl. G01t 1/18; G01n 23/00
U.S. Cl. 250—83.6 R **23 Claims**

A radiation measurement system for measuring an absorption-dependent property of a material is employed in a digital process control system. The radiation measurement system includes an automatic standardization system for performing

zero and source standardization and a detector for detecting the completion of each standardization mode. A rate feedback signal is derived in each standardization mode to damp the standardizing operation.

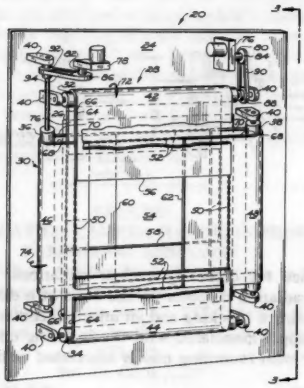


3,668,402

ADJUSTABLE COLLIMATOR

Anthony J. Palermo, South Euclid, and Charles B. Husick, Shaker Heights, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Jan. 21, 1971, Ser. No. 108,465
Int. Cl. G03b *41/16*
U.S. Cl. 250—105 **9 Claims**



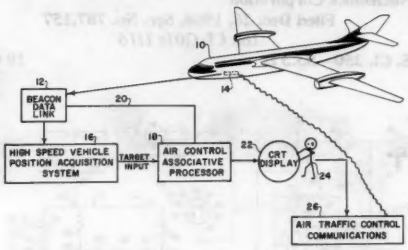
An adjustable X-ray collimator is disclosed which has two web assemblies. Each web assembly has a pair of spaced and connected webs which form a continuous loop reaved over a pair of rollers. The assemblies are positioned near and parallel with one another with the axes of the rollers on one assembly being perpendicular to the other so that one assembly defines the sides and the other assembly the ends of a rectangular X-ray beam opening. The size of the opening is adjusted by rotating the rollers so as to move the interconnected webs to adjust the amount of space between ends of the webs.

3,668,403

METHOD AND APPARATUS FOR VEHICLE TRAFFIC CONTROL

Willard C. Meilander, Kent, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 5, 1969, Ser. No. 821,618
Int. Cl. G06f *15/48*
U.S. Cl. 235—150.23 **17 Claims**



A method for vehicle traffic control is provided which is basically adapted to aircraft and includes a method for aircraft control to eliminate hazardous operating conditions, a method for determining a potential conflict between two or more aircraft in sufficient time to effect correction, a method for determining an effective maneuver to avoid collision, a method for predicting control sector overload, a method for predicting terminal overload, and as a result of conflict, determination of an alternate flight plan or necessary time delay in takeoff to minimize flight costs. The means to accomplish these methods is a sophisticated data processing system properly programmed to a previously prepared algorithm. Preferably, the invention contemplates use of an associative processor so that all calculations can be performed on each aircraft or vehicle simultaneously in parallel. The invention also contemplates a satellite position measuring system to determine conflict of aircraft or surface vehicles over large water expanses. In addition, the system contemplates determining if a given flight path may intersect hazardous weather, or that an aircraft has safe minimum terrain clearance as the system can provide command instructions or controls in accordance with the system information generation.

3,668,404

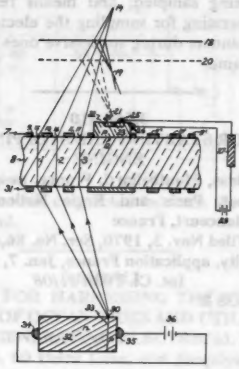
ELECTRO-OPTICAL MICROTRANSDUCER COMPRISING DIFFRACTIVE ELEMENT MONOLITHICALLY INTEGRATED WITH PHOTOELECTRIC DEVICE

Kurt Lehovec, 11 Woodlawn Drive, Williamstown, Mass.

Continuation-in-part of application Ser. No. 692,051, Dec. 20, 1967, now Patent No. 3,546,469. This application Sept. 29, 1970, Ser. No. 76,430
Int. Cl. G02b *5/18*; G02f *1/28*; H01l *15/02*
U.S. Cl. 250—211 J **10 Claims**

The position of a photocell is varied along the optical axis of the light distribution generated by a Fresnel optical system. The variation of the position of the photocell is caused by the displacement of a surface area element, thereby translating said displacement into an electrical signal.

Two or more of the three components of the above-mentioned arrangement, i.e., light source, Fresnel optics and



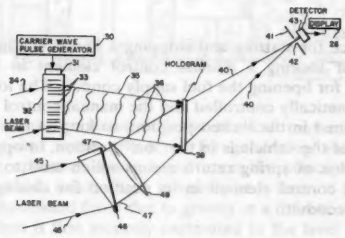
photocell, can be combined into a compact integrated structure.

3,668,405

OPTICAL SYSTEM FOR IDENTIFYING PULSES

Robert E. Brooks, Redondo Beach, and Lee O. Heflinger, Torrance, both of Calif., assignors to TRW, Inc., Redondo Beach, Calif.

Filed June 16, 1969, Ser. No. 791,597
Int. Cl. G08c *9/06*
U.S. Cl. 250—216 **5 Claims**



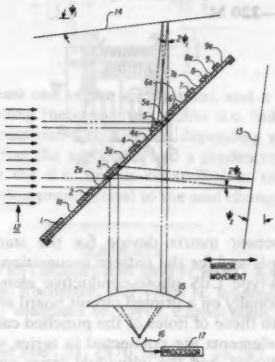
An optical system for identifying a pulse or wavetrain or for compressing the time duration of such a pulse. This is effected by passing monochromatic light through a cell containing a solid or liquid for sustaining an acoustic wave in the desired frequency spectrum. If the pulse to be identified is an electrical pulse, it may be coupled to the cell to set up the acoustic wave. Alternatively, the pulse may be already be an acoustic pulse. The resulting diffracted light wave is then optically filtered by an optical filter such as a hologram on which has previously been recorded a fringe or interference pattern of the pulse to e identified or to be compressed. Accordingly, if the acoustic wave corresponds to the desired electrical pulse, the light passing the hologram may be detected by a detector. If the time duration of the pulse is to be compressed, the hologram or optical filter is so arranged that it will focus the light from the laser substantially in a point or other predetermined area where its exact position may then be detected.

3,668,406

LIGHT PROCESSING DEVICE UTILIZING BEAMSPLITTER HAVING FIRST REGION REFLECTIVE FROM BOTH SIDES AND SECOND REGION WHICH IS TRANSPARENT

Lee R. Reid, Richardson, and Charles Sumner Williams, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 757,371, Sept. 4, 1968, now abandoned. This application Nov. 16, 1970, Ser. No. 90,143
Int. Cl. G01c *3/14*; G02b *27/14*; H01j *39/12*
U.S. Cl. 250—220 SD **6 Claims**



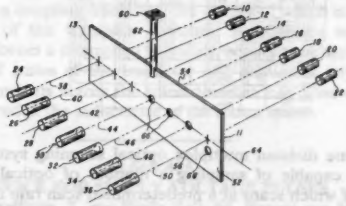
Disclosed is an interferometer using therein a beamsplitter having a thin-film, transparent substrate; a plurality of stripes, each stripe being reflective from both sides and affixed to the substrate; and two mirrors positioned such that as a wavefront of light is divided by the beamsplitter, the divided beams impinge upon the mirrors, whereby when one mirror is moved toward or away from the beamsplitter, the beams impinging upon the movable mirror are changed in phase from the beams impinging upon the other mirror, the phase being measured by a light detector.

3,668,407

OPTICAL SWITCHING FOR KEYBOARD ENCODER

Walter T. Matzen, and Hilton Wayne Spence, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1970, Ser. No. 41,406
Int. Cl. H01j *1/56*
U.S. Cl. 250—229 **8 Claims**



Disclosed is an optically coded encoder especially adapted for use in keyboards for calculators, adding machines and other applications requiring the generation of coded electrical signals in response to the activation of an input key. Encoding is accomplished by the imposition of an optically coded member in substantially columnar light beams thereby

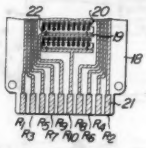
modulating the beams and detection of the modulated beams to generate a code which is uniquely representative of the activated input key.

3,668,408

LIGHT SENSOR MATRIX DEVICE CONSISTING OF PHOTO-CONDUCTIVE ELEMENTS

Oshio Yamashita, Hirakata; Manabu Yoshisa, Osaka; Nobuo Hasegawa, Uji, and Saburo Kitamura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 15, 1971, Ser. No. 124,409
Claims priority, application Japan, Mar. 16, 1970, 45/25705
Int. Cl. H01j *39/12*
U.S. Cl. 250—220 M **1 Claim**



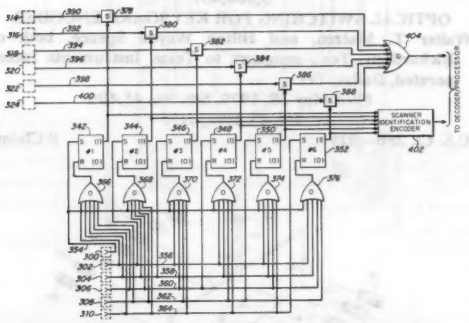
A light sensor matrix device for the static reading of punched cards and for the pattern recognition. It has groups of sandwich-type CdS photo-conductive elements arranged two-dimensionally on a printed circuit board at positions corresponding to those of holes of the punched card. The photo-conductive elements are connected in series with respective associated diodes, and the individual series circuits are connected in matrix form.

3,668,409

SCANNER/DECODER MULTIPLEX SYSTEM

Richard H. Tuhro, Bedford, and Christos B. Kapsambelis, Canton, both of Mass., assignors to Computer Indentics Corporation, Westwood, Mass.

Filed Feb. 26, 1971, Ser. No. 119,105
Int. Cl. H01j *39/12*; **G06k** *9/00*; **H04n** *3/28*
U.S. Cl. 250—236 **18 Claims**



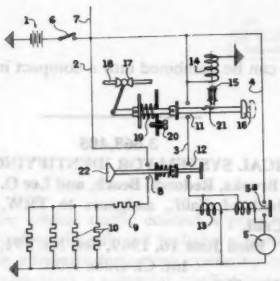
A time division multiplex optical scanning system is disclosed capable of sampling a number of optical scanners, each of which scans at a predetermined scan rate including a plurality of scanners each including a rotatable support means having a plurality of reflective members disposed about its periphery for scanning an object as the support means rotates; and means for rotating the rotatable support means in a predetermined phase relationship with the rotatable support means of each of the other ones of the scanners for enabling the scanners to scan one at a time in sequence; means responsive to radiation reflected from the members for producing an electrical signal that is a function of the reflected radiation; means for generating time frames at a rate equal to the scan rate, each frame having a predetermined number of time slots equal to the number of scanners capable of being sampled; and means responsive to the means for generating for sampling the electrical signal from each of the scanners during successive ones of the time slots during each frame.

3,668,410

DEVICE FOR STARTING AND STOPPING A DIESEL ENGINE

Pierre Ballandras, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed Nov. 3, 1970, Ser. No. 86,460
Claims priority, application France, Jan. 7, 1970, 7000361
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 R **6 Claims**



Device for starting and stopping a Diesel engine having a lock for locking a manual control element in a position thereof for opening the fuel supply conduit. The lock is electromagnetically controlled and the manual control element is maintained in the locked position, so long as the main contactor of the vehicle is in the "on" position, in opposition to the action of spring return means which tend to retain the manual control element in its position for closing the fuel-supply conduit.

3,668,411

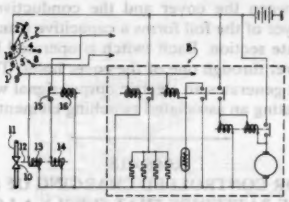
STARTING AND STOPPING DEVICE FOR A DIESEL ENGINE

Andre Leger, Sartrouville, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed June 3, 1971, Ser. No. 149,467
Claims priority, application France, June 11, 1970, 21460
Int. Cl. F02n *17/02*
U.S. Cl. 290—38 **2 Claims**

Device for starting and stopping a diesel engine including a valve in the fuel supply conduit for the engine and an electric supply circuit controlled by a main electric switch having "stop," "accessories," "garage," "operation," and "starting" positions. The valve is shifted between a stable open position and stable closed position by an opening coil and a closing coil respectively of an electromagnetic device. The opening coil is connected between ground and a pair of the electric supply circuit across which voltage is applied when the main switch is on the "starting" contact and the closing coil is con-

nected between the "accessories" contact and ground in series with a normally-closed switch which is opened by a relay



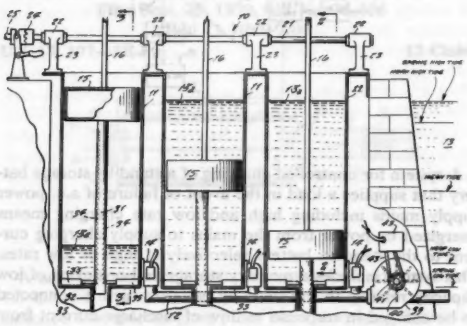
whose actuating coil is connected between the "operation" contact and ground.

3,668,412

APPARATUS FOR HARNESSING THE VERTICAL MOVEMENT OF OCEAN TIDES AND UTILIZE THE FORCE FOR GENERATING ELECTRICAL ENERGY

Charles K. Vrana, 60 Helen Lane, and Jacqulyn G. Lawton, 402 Crescent St., both of Fort Myers Beach, Fla.

Filed Oct. 27, 1970, Ser. No. 84,412
Int. Cl. F03b *13/12*
U.S. Cl. 290—53 3 Claims



An apparatus for harnessing the vertical movement of ocean tides and utilize the force for generating electrical energy, the apparatus being based upon the principal of a large float which exerts force upwardly at a time of a risen tide and a downward force due to gravity at a time of a fallen tide, said float is first securely captivated to the level of the prevailing low tide and which is then released at the height of the tide in order to contribute its full built up force of available energy, the vertical movements of the float being transmited from a vertical superstructure mounted upon the float to a rotatable gear mounted upon a rotatable horizontal shaft journalled in stationary stanchions, and the rotatable shaft thus driving an electrical generator or performing other useful work.

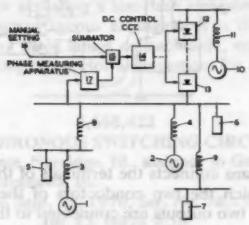
3,668,413

CONTROL SYSTEM FOR HIGH VOLTAGE D.C. LINK CONNECTED BETWEEN A.C. SYSTEMS

John Desmond Ainsworth, Stafford, England, assignor to The English Electric Company Limited, London, England

Filed May 11, 1970, Ser. No. 36,156
Claims priority, application Great Britain, May 9, 1969, 23,663/69
Int. Cl. H02m
U.S. Cl. 307—2 5 Claims

The invention in this application relates to a control system for controlling the power or current in an H.V.D.C. link connected between two a.c. systems and is employed particularly to damp power oscillations developed in such systems which frequently occur after any large disturbances, such as a temporary line short circuit. In particular, the system includes apparatus for defining an output signal proportional to a change function of absolute phase angle ϕ of the alternating



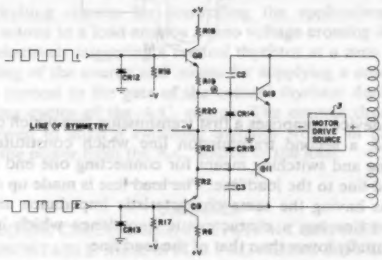
voltage in at least one of the a.c. systems, and a control circuit for controlling the converters in the d.c. link. The control circuit is responsive to a signal depending on both the output signal from the apparatus and a predetermined order signal whereby the d.c. link is controlled to have a component of variation proportional to the said change function.

3,668,414

TRANSITION INTEGRATION SWITCHING AMPLIFIER

Roger F. Norian, Rochester, and Virgil H. Koning, Henrietta, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,287
Int. Cl. G05f *1/08*
U.S. Cl. 307—104 5 Claims



A transition integration switching amplifier for controlling the application of a source voltage for driving an inductive load such as a four-pole, capacitor phased, hysteresis synchronous motor. Symmetrical circuits are provided wherein identical signals of opposite phase control the operation of transistor switches for application of the voltage source to a center tapped motor stator. The signals would be applied to a coupling transistor, the output of which controls the input of the transistor switches. A collector to base capacitor forces a controlled transition between the saturated and cut-off states of the transistor and eliminates any high voltage transients across the transistor that may arise due to energy stored in the inductance of the motor stator.

3,668,415

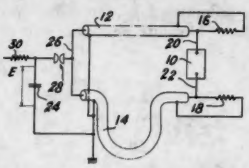
DEVICE FOR SUPPLY VOLTAGE PULSES

Jacques Marilleau, 7, rue Emile Zola-94, Nogent sur Marne, France

Filed Feb. 17, 1971, Ser. No. 116,006
Claims priority, application France, Feb. 23, 1970, 7006238
Int. Cl. H03k *3/00*
U.S. Cl. 307—106 7 Claims

A supply device for delivering rectangular voltage pulses of very small width between two outputs comprise a storage

capacitor, a transmission flat or coaxial line constituted by a plurality of two-conductor sections having the same characteristic impedance and placed in series. A rapid-closure



switching means connects the terminals of the capacitor to a circuit in which the two conductors of the line are incorporated. The two outputs are connected to the same conductor of the line at each end of one of said sections.

3,668,416

DEVICE FOR PRODUCING RECTANGULAR VOLTAGE PULSES OF VERY SMALL WIDTH BETWEEN TWO OUTPUTS

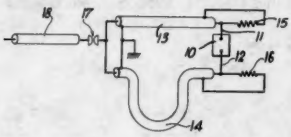
Jacques Marilleau, Nogent-sur-Marne, France, assignor to Commissariat a L'Energie Atomique, Paris, France

Filed Feb. 18, 1971, Ser. No. 116,548

Claims priority, application France, Feb. 23, 1970, 7006329

Int. Cl. H03k 3/00

U.S. Cl. 307—106 **12 Claims**



The device comprises a first transmission line which can be charged, a second transmission line which constitutes the load line and switching means for connecting one end of the charged line to the load line. The load line is made up of two sections having the same characteristic impedance and the charged line has a characteristic impedance which is very substantially lower than that of the load line.

3,668,417

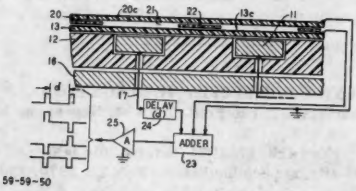
TOUCH-SENSITIVE SWITCH EMPLOYING ELECTRET FOIL

Gerhard Martin Sessler, Summit; Robert Lee Wallace, Jr., Warren Township, Somerset County, and James Edward West, Union, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1970, Ser. No. 101,536

Int. Cl. H01g 7/02; H01h 3/12

U.S. Cl. 307—113 **26 Claims**



A keyboard switching arrangement that is mechanically simple, reliable, and which can be fabricated with an overall thickness of less than ¼ inch, includes a plurality of independent conductive elements aligned with holes in a protective front cover. A single sheet of a metallized foil electret is interposed between the cover and the conductive members. The metal layer of the foil forms a capacitive transducer with each backplate section. Each switch is operated by touching the foil electret through one of the cover holes. The resulting displacement generates an electric output signal which is utilized for actuating an associated switching element or the like.

3,668,418

SYSTEM FOR CONTROLLED CHARGING OF STAND-BY STORAGE BATTERIES THAT SUPPLY A LOAD ON FAILURE OF POWER SUPPLY TO THE LOAD FROM POWER MAINS

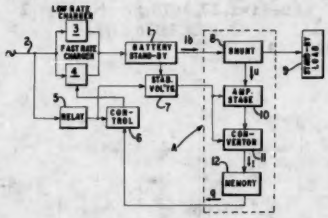
Pierre Godard, Livry-Gargan, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France

Filed Dec. 22, 1969, Ser. No. 887,198

Claims priority, application France, Oct. 1, 1969, 6933547

Int. Cl. H02j 7/00

U.S. Cl. 307—66 **19 Claims**



A system for controlled charging of a stand-by storage battery that supplies a load in the event of failure of a.c. power supply mains including high and low rate charging means energized by power from the mains to supply charging current to the stand-by battery selectively at high or low rates. This system includes a memory storage cell or device of low capacity relative to the stand-by battery which is connected to be charged in response to flow of discharge current from the stand-by battery only during stand-by operation of said stand-by battery while power supply from the mains is interrupted. The extent of charge thus received by the memory storage cell is proportional to the current actually discharged by the stand-by battery only while and if it is operative and discharging into the load during mains power failure. Upon restoration of power in the mains, the proportionately charged memory storage cell is caused to discharge automatically at a constant rate until exhausted and the discharge current of the memory cell is used to control circuit means to effect automatically high-rate charging of the stand-by battery from the mains until substantial exhaustion of the proportionate charge of the memory storage cell occurs, whereupon low rate charging of the stand-by battery from the mains commences automatically.

3,668,419

ELECTRICAL POWER SOURCE AND HEAT AUGMENTATION SYSTEM FOR USE IN AUTOMOTIVE VEHICLES

James R. Cherry, Barrington; Theodore A. Byles, Villa Park, and Ole K. Nilssen, Barrington Hills, all of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

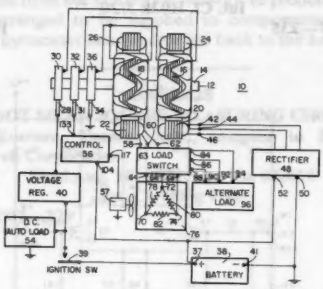
Filed Dec. 30, 1970, Ser. No. 102,808

Int. Cl. H02j 7/00

U.S. Cl. 307—66 **7 Claims**

An auxiliary heat supply and electrical power source for a vehicle is comprised of first and second independently controlled alternators connected in tandem to a common shaft.

The output of the first alternator is connected to a conventional electrical load and the output of the second alternator may be connected to a heat producing resistive load. The



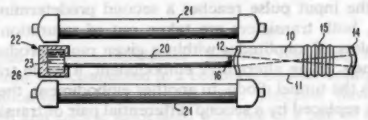
output of the second alternator can be controlled by circuitry including switches operating in cooperation with a conventional heating system and a fan speed control mechanism.

3,668,420

1.5 MICRON RAMAN LASER

James T. Vanderslice, Rockville, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,466
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 **13 Claims**



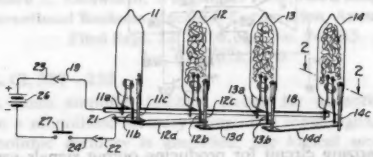
A laser system which emits Raman-stokes radiation in the 1.5 micron (eye-safe) region is achieved by directing a Q-switched 1.06 micron giant pulse beam through a Raman-active medium which has a Raman frequency shift of around 3000 cm^{-1}. The Q-switch is a saturable absorber dye from the class of bivalent transition metal dithiene complexes.

3,668,421

PHOTOFLASH LAMP ARRAY WITH AUTOMATIC SWITCHING

Harry J. Bowers, Jr., Mayfield Heights, Ohio, assignor to General Electric Company

Filed Dec. 4, 1970, Ser. No. 95,291
Int. Cl. H02j 1/00
U.S. Cl. 307—117 **17 Claims**



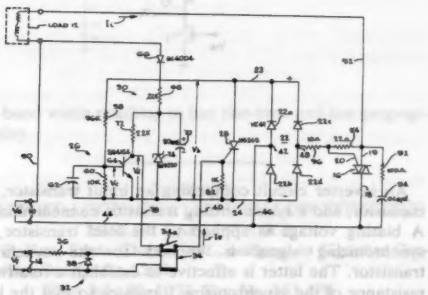
An array of photoflash lamps is provided with a plurality of switching means for connecting successive lamps to a source of firing pulses. Each flash lamp, except the last to flash, has a switch pin adhered thereto by means of a protective lacquer coating. Each switch pin coacts with a switching means so that when a lamp flashes the heat thereof softens the lacquer and the switch pin becomes movable and causes the associated switching means to connect an unflashed lamp into the firing circuit so as to be flashed by the next firing pulse. An indicator pin is adhered by lacquer on the last lamp to be flashed, for actuating a last-flash indicator mechanism. A particularly advantageous arrangement is disclosed for a dual array having three lamps on each side, and also an improved three-prong connector arrangement for a dual array.

3,668,422

SYNCHRONOUS SWITCHING CIRCUIT

Joseph E. Pascente, Norridge, Ill., assignor to Grigsby-Barton, Inc., Rolling Meadows, Ill.

Filed Sept. 28, 1970, Ser. No. 76,132
Int. Cl. H01h 9/56
U.S. Cl. 307—133 **17 Claims**



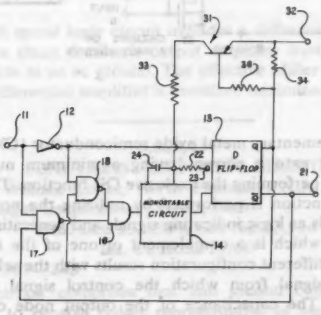
Switching circuits for controlling the application of an A.C. source to a load employ a zero voltage crossing detector for selectively triggering a control thyristor at a zero voltage crossing of the source and means for supplying a continuous latch current to the gate of the control thyristor during succeeding cycles of the A.C. source. The control thyristor is employed to latch a switching thyristor which, in turn, applies the power from the A.C. source to the load.

3,668,423

LOGIC CIRCUIT DELAY SYSTEM COMPRISING MONOSTABLE MEANS FOR PROVIDING DIFFERENT TIME DELAYS FOR POSITIVE AND NEGATIVE TRANSITIONS

Francis O. Couch, Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 18, 1971, Ser. No. 125,670
Int. Cl. H03k 5/153
U.S. Cl. 307—208 **4 Claims**



A logic circuit having a single monostable circuit operating a flip-flop circuit and means controlled by the latter to switch

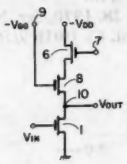
resistance values in an RC circuit of the monostable for establishing different time delays for positive and negative logic transitions.

3,668,424

INVERTER CIRCUIT

Hirohiko Yamamoto, and Masamichi Shiraishi, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 30, 1970, Ser. No. 85,673
Claims priority, application Japan, Nov. 1, 1969, 44/88260
Int. Cl. H03k *19/40*
U.S. Cl. 307—214 4 Claims



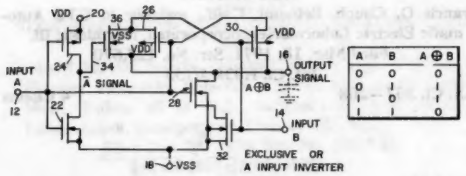
An inverter circuit comprising an input transistor, a load transistor, and a synchronizing transistor connected in series. A biasing voltage is applied to the load transistor, and a synchronizing signal is applied to the synchronizing transistor. The latter is effective to establish a relatively low resistance of the synchronizing transistor so that the load resistance and thus the switching speed of the circuit are substantially independent of the amplitude of the synchronizing pulse.

3,668,425

COMPLEMENTARY METAL OXIDE SEMICONDUCTOR EXCLUSIVE OR GATE

Bernard H. Schmidt, Jr., Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 28, 1970, Ser. No. 101,733
Int. Cl. H03k *19/08*, *19/32*
U.S. Cl. 307—216 18 Claims



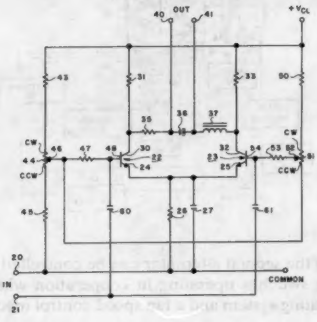
A complementary metal oxide semiconductor (CMOS) exclusive OR gate is shown having a minimum number of devices for performing the exclusive OR function. The exclusive OR function is performed by utilizing the normal two input signals as logic indicating signals and generating a control signal which is a complement of one of the two logic signals. A different configuration results with the selection of the logic signal from which the control signal is to be generated. The capacitance of the output node or output signal is charged by any one of a plurality of current paths associated with each logic configuration.

3,668,426

DIFFERENTIAL PULSE HEIGHT DISCRIMINATOR

Richard D. Culver, Harris County, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 23, 1969, Ser. No. 844,014
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 10 Claims



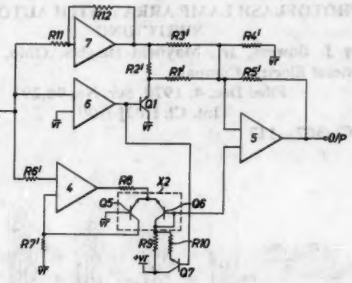
A pair of transistors are each normally biased to saturation, one more strongly than the other. A tunnel diode connected between the collectors, respectively, produces an output voltage only when one of the transistors is driven out of saturation, but not when both transistors are non-saturated. Neither transistor is taken out of saturation until the signal pulse input reaches a certain predetermined amplitude. When the input pulse reaches a second predeterminde amplitude, both transistors are taken out of saturation. Thus, only pulses of amplitudes within a given range produce output signals. In an alternative embodiment, a single transistor replaces the tunnel diode. In another embodiment, the tunnel diode is replaced by a second differential pair of transistors.

3,668,427

OPTICAL PYROMETER AMPLIFIERS

Kenneth R. Curwen, Southampton, England, assignor to Kollsman Instrument Limited, Southampton, England

Filed Apr. 8, 1970, Ser. No. 26,714
Claims priority, application Great Britain, Apr. 10, 1969, 18,526/69
Int. Cl. G06g *7/12*
U.S. Cl. 307—229 7 Claims



A linearizing circuit for producing output signals varying linearly with temperature from input signals derived from a pyrometer head and varying non-linearly with temperature comprising an input amplifier stage responsive to said nonlinear input signals, a linearizing network responsive to output signals from the amplifier stage and including a circuit for generating signals representative of the logarithm of the

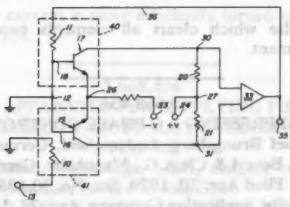
input signal and summation means for adding a portion of the input signal and a fixed value signal to the logarithmic signal to produce an output signal which is substantially linear with temperature and an output amplifier stage responsive to output signals from the linearizing network to produce amplified signals arranged to be supplied to components associated with the pyrometer head and/or fed back to the head.

3,668,428

ROOT MEAN SQUARE MEASURING CIRCUIT

Henry Koerner, Tucson, Ariz., assignor to Burr-Brown Research Corporation

Filed Aug. 10, 1970, Ser. No. 62,416
Int. Cl. G06g *7/20*
U.S. Cl. 307—229 **7 Claims**



A pair of semiconductor junction devices, such as transistors, are connected in a common emitter configuration with suitable forward biasing. The junction devices are matched and each is associated with one of a pair of matched resistors. Heat transfer means connects each resistor with one of the junction devices; heat generated in the resistor is transmitted to the junction device to cause temperature variations therein. The circuit elements, such as transistors, exhibit a forward voltage drop that is a function of the temperature of the element; the voltage drops across the transistors therefore vary as a result of the power being dissipated by the associated resistor. The transistors are connected to a differential amplifier which senses and amplifies the differential voltage resulting from the different voltage drops and produces an output signal in response thereto. The output signal is connected in a feedback loop to one of the matched resistors while an input terminal is provided to the second matched resistor for connecting thereto a signal to be measured.

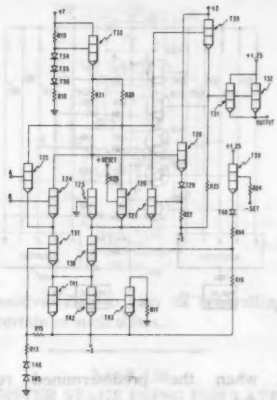
3,668,429

SENSE AMPLIFIER LATCH FOR MONOLITHIC MEMORIES

Richard A. Ainsworth, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1970, Ser. No. 74,433
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **4 Claims**

A sense amplifier latching circuit for accepting signals from a monolithic memory array. The input signal from the monolithic memory is amplified, the logical sense of the input is determined and held in the latch, and the signal is translated down to current switch logic circuit levels having a capability for large fan-out and fan-in (dot or). The input to the sense amplifier latch has a grounded base clamp providing a very low impedance input in the presence of bi-polar noise current. The sense amplifier latch circuit further includes threshold tracking, temperature compensating, and power supply compensating circuits. The entire circuit includes emitter follower and grounded base circuits providing



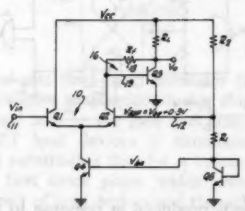
a high band width resulting in fast rise-time and low propagation delay.

3,668,430

HIGH SPEED LOGIC CIRCUIT WITH LOW EFFECTIVE MILLER CAPACITANCE

David T. Kan, Santa Clara, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed July 12, 1971, Ser. No. 161,476
Int. Cl. H03k *19/30, 19/34*
U.S. Cl. 307—235 **3 Claims**



A high speed logic circuit includes a differential amplifier driving a shunt feedback output amplifier having an input which acts as an ac ground. The effective Miller capacitance of the differential amplifier is therefore minimized.

3,668,431

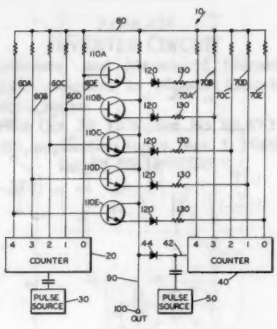
FUNCTIONS COMPARING CIRCUIT

George William Locke, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

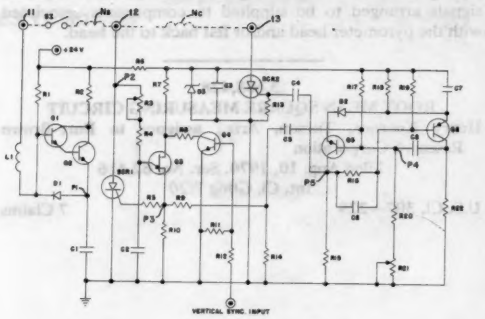
Filed Oct. 23, 1970, Ser. No. 83,514
Int. Cl. H03k *17/60*
U.S. Cl. 307—243 **3 Claims**

The circuit comprises first and second counters, each adapted to receive pulses representative of remote occurrences, and a gate circuit between the counters, the interconnections being such that the gate circuit permits no output

pulse to be provided when a predetermined relationship exists between the counters and permits an output pulse to be transmitted when the predetermined relationship is disturbed.



clears" the remaining elements by a second pulse. The next setting pulse selects a given element and is followed by a clearing pulse which clears all elements except the last selected element.



3,668,432

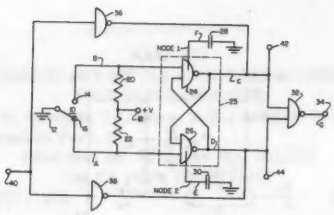
LOGIC SENSING CIRCUIT HAVING SWITCH CONTACT ANTI-BOUNCE FEATURE

Russell R. Rhodes, Marlboro, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1970, Ser. No. 102,470

Int. Cl. H03k *17/00*

U.S. Cl. 307—247 A **13 Claims**



A strobe pulse is produced in response to the change in state of a switch without responding to switch contact bounce. Capacitors connected to node inputs of gates in a bistable multivibrator provide a delayed response of the multivibrator so that both outputs thereof are simultaneously at the same signal level sufficient to enable a gate producing strobe pulse.

3,668,433

DOUBLE PULSE SWITCH CONTROL SYSTEM AND CIRCUIT

Edward Camp Dowling, Harrisburg, and John Breniser Thomas, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Original application Aug. 30, 1966, Ser. No. 576,150, now Patent No. 3,535,691. Divided and this application June 1, 1970, Ser. No. 54,043

Int. Cl. H03k *17/20, 17/26, 3/284*

U.S. Cl. 307—247 A **5 Claims**

This invention relates to an overlap switching circuit for setting and clearing a plurality of memory elements. A drive circuit "sets" a selected element by a first pulse and then "-

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3,668,434

NOISE SUPPRESSING A C PHASE CONTROL SYSTEM

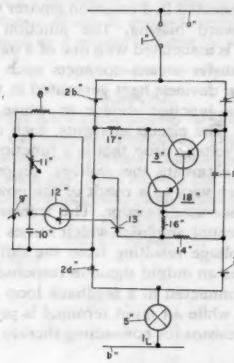
Heinrich-Josef Brungsberg, Ludenscheid, Germany, assignor to Brown, Boveri & Cie A.G., Mannheim, Germany

Filed Apr. 20, 1970, Ser. No. 30,135

Claims priority, application Germany, Apr. 25, 1969, P 19 21 122.4

Int. Cl. H03k *17/00;* **G05f** *1/44*

U.S. Cl. 307—257 **4 Claims**



An a-c phase control circuit includes a power transistor for phase control replacing the thyristor generally used for this purpose.

3,668,435

EFFICIENCY PULSE FORMING NETWORK CHARGING SYSTEMS

Robert P. Farnsworth, Los Angeles, and Rodney J. Dahlinger, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

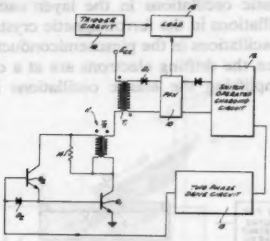
Filed Aug. 12, 1970, Ser. No. 63,042

Int. Cl. H03k *5/00*

U.S. Cl. 307—260 **6 Claims**

A current feedback switch for the charging supply of a pulse forming network (PFN) is provided with regenerative feedback through a transformer T_2 and a control transistor Q_2 in order that base current be more efficiently provided to drive a main switching transistor Q_1 to saturation. Turning-

off the main switching transistor Q_1 is facilitated by the transistor Q_2 in series with the feedback transformer T_2. In



that manner current is more efficiently turned on and off to charge the PFN.

3,668,436

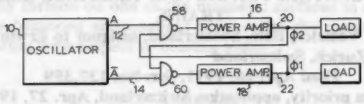
CIRCUIT APPARATUS FOR SUPPLYING FIRST AND SECOND TRAINS OF MUTUALLY EXCLUSIVE CLOCK PULSES

Stanley H. Bacon, Northridge, Calif., assignor to Computer Design Corporation, Santa Monica, Calif.

Filed Dec. 15, 1969, Ser. No. 885,210

Int. Cl. H03k *1/12;* **H03b** *25/00*

U.S. Cl. 307—262 **4 Claims**



A two phase clock circuit particularly useful for driving logic circuitry whose operation requires the definition of two substantially non-overlapping clock phases. The clock circuit includes a square wave oscillator having true and complementary output terminals, each driving a different power amplifier. Each oscillator output terminal is connected to its associated power amplifier through a NOR gate. The second terminal of each NOR gate is connected to the output of the opposite power amplifier so that neither power amplifier can begin to form a clock pulse until the clock pulse formed by the other power amplifier has terminated, or in other words, until the output voltage of the other power amplifier has fallen to a defined threshold level.

3,668,437

PULSE GENERATOR APPARATUS

Atanasije M. Bankovic, Belfort, France, assignor to Societe Industrielle Honeywell Bull, Paris, France

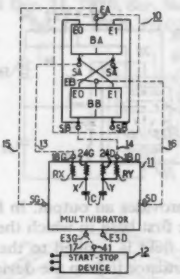
Filed Apr. 6, 1970, Ser. No. 25,999

Claims priority, application France, Apr. 9, 1969, 6910934

Int. Cl. H03k *1/18, 17/60*

U.S. Cl. 307—265 **6 Claims**

A pulse generator for providing pulse sequences in which the individual pulses are of different durations, wherein a multistable device having a plurality of different states determines the order of the pulses of the sequences, wherein a multivibrator steps the multistable device through its sequence of states, and wherein the multistable device is coupled to the multivibrator to vary its controlling time constants during certain of such states.



3,668,438

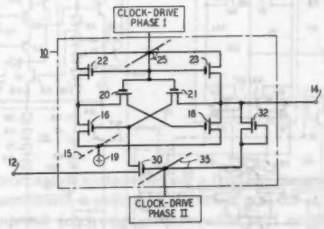
SHIFT REGISTER STAGE USING INSULATED-GATE FIELD-EFFECT TRANSISTORS

Glen Trenton Cheney, and Ernam Fillmore King, both of Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 9, 1970, Ser. No. 53,459

Int. Cl. H03k *19/00, 3/286*

U.S. Cl. 307—279 **2 Claims**



An insulated-gate field-effect transistor (IGFET) shift register stage occupies less semiconductor chip area because a separate ground lead to the gate and drain electrodes of a pair of IGFET load devices is eliminated. This lead is eliminated by substituting therefor a connection from those devices to a first clock phase which controls conduction through that pair of load devices and through a pair of cross-coupling transistors. A second clock phase, which is out of phase with the first clock phase, controls conduction through both an input transistor of the stage and a third IGFET load device connected to an output terminal of the stage.

3,668,439

MAGNETICALLY OPERATED SEMICONDUCTOR DEVICE

Kyoichiro Fujikawa, and Saburo Takamiya, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Marunochi, Chiyoda-ku, Tokyo, Japan

Filed Sept. 4, 1970, Ser. No. 69,867

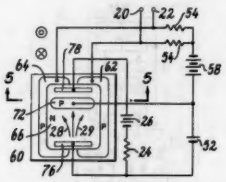
Claims priority, application Japan, Sept. 11, 1969, 44/72195; Oct. 31, 1969, 44/87397; Dec. 16, 1969, 44/101189

Int. Cl. H01l *11/00, 15/80*

U.S. Cl. 307—309 **21 Claims**

In PNP transistors a transverse electric field is established in the base embraced by two opposite collectors whose direction is parallel to the emitter disposed on the base. A magnetic field is applied across the transistor perpendicularly to the emitter junction originally biased to zero. The Hall ef-

fect serves to deflect electrons flowing through the base toward either one of the end portions of the emitter junction to forwardly bias it. That collector adjacent the forwardly



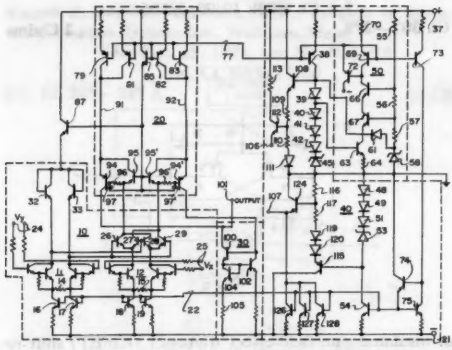
biased emitter end provides an output. In PNPN devices the emitter traverses the first base in which the majority carriers stream. A magnetic field is applied to the stream as in the above mentioned transistor to turn the device ON.

3,668,440

TEMPERATURE STABLE MONOLITHIC MULTIPLIER CIRCUIT

Walter Richard Davis, Tempe, and James E. Solomon, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 16, 1970, Ser. No. 81,399
Int. Cl. H03k 17/14
U.S. Cl. 307—310 **17 Claims**



A monolithic four-quadrant multiplier circuit, the output off which is subject to variations caused by changes in beta (β) due to changes in temperature, is temperature compensated by providing operating current thereto from a regulating circuit which causes the operating current for the multiplier to vary in accordance with a predetermined alpha (α) relationship to cancel out the effect of changes in β on the multiplier output. A level shifting circuit is connected to the output of the multiplier and causes the output of the multiplier to be referenced to ground. In addition, the level shifting circuit includes roll-off filter circuits to prevent high frequency signals from passing to the output terminals over paths which would subject the signals to large amounts of phase shift.

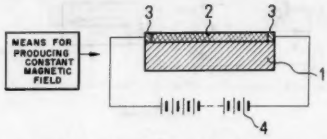
3,668,441

METHOD OF GENERATION OF SPONTANEOUS ELASTIC-SPIN-OSCILLATIONS IN FERROMAGNETOPIEZOSEMICONDUCTOR CIRCUITS

Sylwester Kaliski, ul. Einsteina, Warszawa 49, Poland

Filed Dec. 14, 1970, Ser. No. 97,499
Claims priority, application Poland, Dec. 13, 1969, 137535
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 **5 Claims**

A method of generating spontaneous elastic-spin-oscillations in ferromagneto-piezosemiconductor circuits, including a slab of ferromagnetic crystal and a semiconductor layer on said slab, comprises applying a d.c. voltage through ohmic contacts to the semiconductor layer to produce surface and transverse oscillations the surface oscillations inducing in a semiconductor layer, a current of drifting electrons, modulating the current of drifting electrons by a piezoelectric field induced by elastic oscillations in the layer caused by the elastic spin oscillations in the ferromagnetic crystal, amplifying the elastic oscillations in the piezosemiconductor layer by the current when the drifting electrons are at a critical drift of velocity, amplifying the elastic oscillations in the ferromagnetic crystal when the elastic oscillations in the piezosemiconductor are amplified, the circuit being in a state of spin-acoustic resonance by placing the circuit in a constant magnetic field having a value determined by the circuit parameters, and producing a multiplication of spin oscillations through elastic-spin couplings, wherein the dimensions of the slab ensure a maximum reflection from the boundary borders of the slab when the surface oscillations meet Sommerfeld boundary conditions and when the transverse oscillations ensure a maximum reflection from the surface vertical to the direction of the propagation of elastic-spin waves.

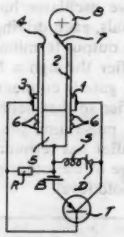


3,668,442

RESONATORS FOR DRIVING TIMEPIECE GEAR TRAINS

Gerhard Vosseler, Bale, Switzerland, assignor to Erwin Bernheim, Zurich, Switzerland

Filed Apr. 26, 1971, Ser. No. 137,359
Claims priority, application Switzerland, Apr. 27, 1970, 6261/70
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 **10 Claims**



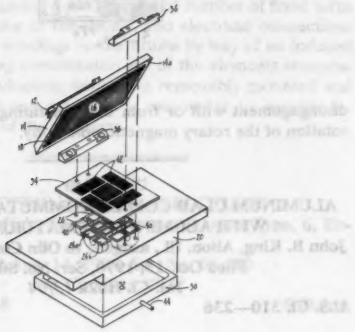
A timepiece resonator comprises mechanically connected first and second oscillating crystals connected respectively in the collector-emitter and collector-base circuits of a transistor. At least the first crystal is secured to a blade adjacent to a clamping point of the blade, and a free end of the blade carrying driving means for cooperation with a pinion, oscillates at a sub-harmonic of the resonant frequency of the crystals.

3,668,443

MAGNETIC INCREMENTING DETENT

Samuel A. Schwartz, Los Altos, Calif., assignor to Data General Corporation, Southboro, Mass.

Filed May 17, 1971, Ser. No. 144,164
Int. Cl. H02k 41/02
U.S. Cl. 310—12 20 Claims



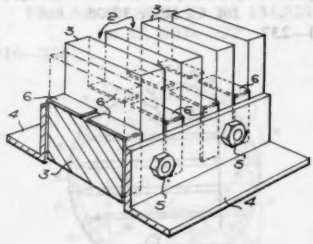
A multiphase magnetic incrementing drive for rapidly moving a magnetic head toward and away from the center of a magnetic information storage disc in very small yet precisely controllable and consistently reproducible increments. A movable member carrying the head is slideably mounted above a stationary member by an air bearing and both members are provided with juxtaposed magnetic coupling surfaces. At least three magnetic areas, each having pole pieces in relative phase differential to those in other areas are integrally formed on one of the magnetic surfaces in a geometrically balanced arrangement to equalize the magnetic driving forces with respect to bearing loads.

3,668,444

LINEAR MOTORS WITH COOLING MEANS

Anthony Walter Davey, Hathern, England, assignor to Herbert Morris Limited, Loughborough, County of Leicester, England

Filed Mar. 1, 1971, Ser. No. 119,660
Int. Cl. H02k 41/02
U.S. Cl. 310—13 6 Claims



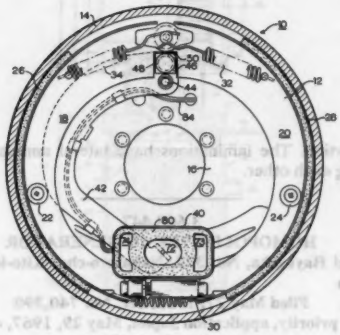
A linear induction motor in which the stationary member is formed with coil windings housed in slots between lamination packs mounted in a frame and having fingers or inserts introduced into the winding slots, the fingers or inserts extending over the edges of the lamination packs and being clamped to the motor frame.

3,668,445

ELECTROMAGNET FOR BRAKES AND CLUTCHES

Leroy K. Grove, South Bend, Ind.

Filed Dec. 21, 1970, Ser. No. 99,896
Int. Cl. H02k 7/102
U.S. Cl. 310—77 19 Claims



An electromagnet system having a friction material for engaging an armature, a pole and electrical coil for moving said friction material into engagement with said armature, the pole being constructed of a material which has magnetic characteristics and less wear resistance than the friction material so that the friction material normally forms the principal or only surface of contact between the electromagnet and the armature. The relationship of surfaces between the pole and the friction material may be obtained by the use of compacted, unfused powdered metal as the surface for the pole. The system is adaptable for use where the magnetic attraction of an electromagnet to an armature is employed as a linkage force for a braking function or direct frictional drive, and particularly for use in vehicle brakes and power transmission clutches and brakes.

3,668,446

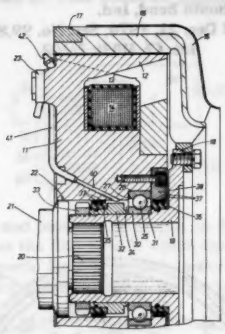
SEALING ARRANGEMENT FOR EDDY CURRENT APPARATUS

Alfred Hoyler, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 29, 1970, Ser. No. 85,145
Claims priority, application Germany, Nov. 3, 1969, G 69 42 657.9
Int. Cl. H02k 5/16
U.S. Cl. 310—90 8 Claims

The hub portions of a field generating means and of an Eddy current developing means form an annular space in which a ball bearing is located. Two sealing rings are provided in the annular space on opposite sides of the ball bearing and form on one side of the same, a storage chamber filled with a lubricating grease for the ball bearing. Each sealing ring is attached to one hub portion and having parallel

annular grooves. Stacks of annular metal laminations are respectively located in the grooves, and attached to the other



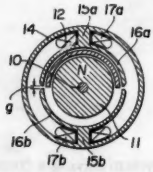
hub portion. The laminations have lateral annular surfaces abutting each other.

3,668,447

HOMOPOLE-TYPE AC GENERATOR

Enakichi Hayasaka, No. 322, Nakazato-cho, Kito-ku, Tokyo, Japan

Filed May 27, 1968, Ser. No. 740,390
Claims priority, application Japan, May 29, 1967, 42/33690
Int. Cl. H02k *17/00*
U.S. Cl. 310—166 **12 Claims**



A homopole-type AC generator having a rotary magnetic pole body mounted on a rotary drive shaft such that the magnetic axis coincides with the axis of said drive shaft, a pole piece provided on the homopole of the N and S poles of said pole body, magnetic paths along which and through said pole piece the magnetic flux flows from one pole of said rotary magnetic pole body to the other pole, coils disposed in said magnetic paths so as to interlink said magnetic flux, whereby the rotation of said pole body generates AC voltage depending on engagement and disengagement operations between said magnetic flux and the magnetic circuit produced by said coils.

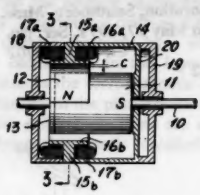
3,668,448

HOMOPOLE TYPE AC GENERATOR

Enakichi Hayasaka, No. 322, Nakazato-cho, Kita-ku, Tokyo, Japan

Continuation-in-part of application Ser. No. 740,390, May 27, 1968. This application May 13, 1971, Ser. No. 142,923
Claims priority, application Japan, May 29, 1967, 42/33690; May 15, 1970, 45/40890
Int. Cl. H02k *17/00*
U.S. Cl. 310—166 **6 Claims**

A homopole type AC generator consisting of a rotary magnetic pole body rotatable by a rotational force from outside, a yoke core through which magnetic fluxes flow from the N pole of the rotary magnetic pole body to the S pole and forms a part of magnetic path, and generating coils provided at positions interlinking with the magnetic path. The generating coils have induced AC voltage so as to effect AC generation as the magnetic fluxes make magnetic engagement and



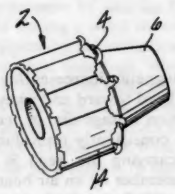
disengagement with or from the generating coils during the rotation of the rotary magnetic pole body.

3,668,449

ALUMINUM CLAD COPPER COMMUTATOR FOR USE WITH ALUMINUM ARMATURE WIRE

John B. King, Alton, Ill., assignor to Olin Corporation

Filed Oct. 13, 1970, Ser. No. 80,346
Int. Cl. H02k *13/04*
U.S. Cl. 310—236 **9 Claims**



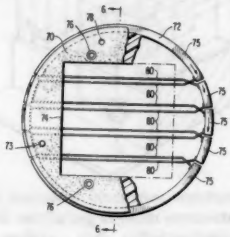
A new and improved electrical commutator comprising a plurality of spaced apart plates wherein said plates have at least one outwardly projecting finger for holding an armature wire and wherein the plates are copper and the finger is copper integrally bonded to a side of aluminum.

3,668,450

VARIABLE INDUCTION DEVICE

Donald S. Rozelle, Owego, N.Y.; Ralph B. Rozelle, Forty Fort, and Umid R. Nejib, Edwardsville, both of Pa., assignors to Magnetech Industries, Inc., Montrose, Pa.

Original application June 2, 1970, Ser. No. 42,703, now Patent No. 3,614,692, dated Oct. 19, 1971. Divided and this application June 24, 1971, Ser. No. 156,311
Int. Cl. H01r *39/06*
U.S. Cl. 310—237 **12 Claims**



The disclosure relates to a variable induction device or transformer of the type comprising a rectangular magnetic

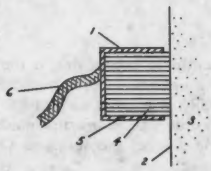
core having two primary transformer windings on opposite core legs and a transferable secondary winding carried by a pair of axially rotatable drums which are each mounted in telescoping relationship over an associated one of the primary transformer windings. Each drum carries a portion of the secondary winding, and the portions are connected in series opposition. The turns of the transferable secondary winding may be transferred from one drum to the other by rotating the drums in synchronism, thereby varying the effective number of transformer secondary turns. A fixed secondary winding or coil having a predetermined number of fixed turns is provided on one of the drums, and electrical connections are made to the windings on the drums by way of an induced current cancelling commutator. All of the elements comprising a variable induction device are removably mounted and one of the core end members is removable to provide interchangeability of the elements.

3,668,451

ELECTRICAL BRUSH STRUCTURE

Ian Roderick McNab, Fossway, Newcastle upon Tyne, 6, England

Filed Aug. 14, 1970, Ser. No. 64,550
Int. Cl. H01r *39/18*
U.S. Cl. 310—248 **6 Claims**



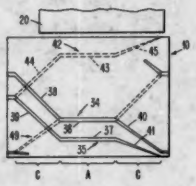
A current transfer brush for an electrical machine consists of refractory fibers, such as aluminum oxide fibers, with a deposited metallic film. The fibers provide mechanical strength with flexibility while the metallic films carry the current and high current densities can be achieved with low wear rates for the brushes and the contact surface which they traverse.

3,668,452

DYNAMOELECTRIC MACHINE WITH IMPROVED MAGNETIC FIELD CONSTRUCTION

Paul Y. Hu, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,329
Int. Cl. H02k *1/22*
U.S. Cl. 310—266 **9 Claims**



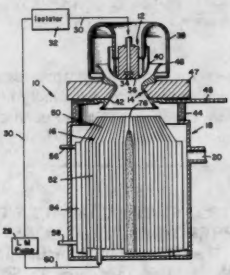
A direct current motor of the printed circuit armature type wherein the stator permanent magnets are physically dimensioned to immerse substantially the entire armature winding in the stationary magnetic flux field.

3,668,453

ELECTRICAL SWITCH DEVICE HAVING A FED LIQUID-METAL CATHODE AND A NON-INTERCEPTING ANODE

Kenneth T. Lian, Thousand Oaks, and Ronald C. Knechtli, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of application Ser. No. 720,692, Apr. 11, 1968, now abandoned. This application July 1, 1970, Ser. No. 51,706
Int. Cl. H01j *1/10, 7/16*
U.S. Cl. 313—7 **10 Claims**



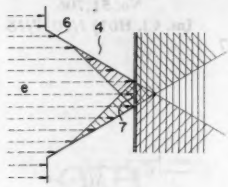
The electrical switch device has an envelope in which is mounted a liquid-metal cathode, an anode, and a condenser. The cathode is capable of very high electron-to-atom emission ratio. A desirable value for the electron-to-atom emission ratio is on the order of 100 or more and is attainable by means of a cathode such as disclosed in U.S. Pat. No. 3,475,636, when used in the switch device. The condenser has a very much larger area than the exposed liquid metal area on the cathode, and it is kept at a low enough temperature to efficiently condense the liquid-metal vapor emitted by the cathode. With mercury used as the liquid metal, the condenser temperature is kept substantially below 0° C., preferably at about −35° C. which is just above the melting point of mercury. When arcing occurs from the liquid metal, a plasma jet of electrons, ions, and neutral particles is emitted from the arc spot. The anode is mounted between the cathode and the condenser, and it is positioned at the edge of the plasma jet to capture the major portion of the electron flow for electrical conduction. Most of the ions and neutral particles as well as a sufficient number of electrons to preserve space-charge and current neutrality, pass the anode in the plasma jet and are captured on the condenser. The combination of the high electron-to-atom emission ratio of the cathode with the large, low-temperature condenser results in an equilibrium background pressure (i.e., pressure outside the plasma jet) of at least as low as 10^{-3} Torr during arcing, and lower than 10^{-4} Torr during non-arcing periods. These low pressures are obtained by maintaining the condenser in the range of low temperatures defined above. This low background pressure, in turn, permits the essentially unperturbed propagation of the plasma jet between the cathode and the surfaces upon which it impinges, i.e., condenser and anode. Such a discharge mode is commonly referred to as a "vacuum arc." The fact that the plasma jet is emitted only during arcing, and that the pressure within the space surrounding this jet is kept low, results in the ability to hold off electric fields up to 50 kV per centimeter between anode and cathode immediately after cessation of arcing.

3,668,454

FINE FOCUS X-RAY TUBE

Yoshihiro Shimura, Tokyo, Japan, assignor to Rigaku Denki Company Limited, Chiyoda-ku, Tokyo, Japan

Filed Mar. 9, 1970, Ser. No. 17,571
Claims priority, application Japan, Aug. 5, 1969, 44/61441; Nov. 17, 1969, 44/91454
Int. Cl. H01j 35/08, 35/14
U.S. Cl. 313—57 3 Claims



The present invention provides a fine focus X-ray tube with improved directivity wherein extremely intensive X-rays are generated from a fine focus and the position of the focus can be moved finely.

3,668,455

ELECTRICAL TRANSLATING DEVICE CONTAINING SPHEROIDAL PHOSPHORS

Ernest A. Dale, Hamilton, and Martha J. B. Thomas, Winchester, both of Mass., assignors to Sylvania Electric Products Inc.

Filed July 1, 1968, Ser. No. 741,717
Int. Cl. H01j 1/63, 63/04
U.S. Cl. 313—109 12 Claims

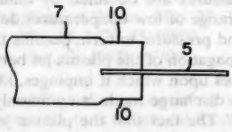
A fluorescent lamp with an inorganic phosphor coating on the lamp envelope. The phosphor particles have the shape of foraminous spheres with a diameter between about 3 and 20μ. In the preferred embodiment, these spheres are hollow so that there is a maximum of emitting surface for a minimum weight of powder.

3,668,456

LAMP HAVING IMPROVED PRESS SEAL

John W. Anderson, Danvers, Mass., assignor to Sylvania Electric Products Inc.

Filed Aug. 28, 1970, Ser. No. 67,699
Int. Cl. H01j 5/62, 5/48
U.S. Cl. 313—318 6 Claims



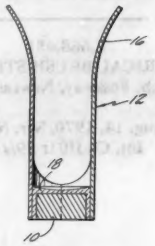
A thin refractory metal ribbon is completely embedded in the press seal of a high silica glass lamp envelope. One end of the ribbon is securely held within a longitudinal slot of a lamp lead-in wire, thereby establishing physical and electrical connection between the ribbon and the lead-in wire.

3,668,457

BRAZING ALLOY FOR BONDING THERMIONIC CATHODE TO SUPPORT

Fred M. Gardner, South Glastonbury; Joseph R. Gervais, Marlborough, and Frank S. Nettleton, Meriden, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 25, 1969, Ser. No. 852,578
Int. Cl. H01j 1/14, 19/06
U.S. Cl. 313—346 5 Claims



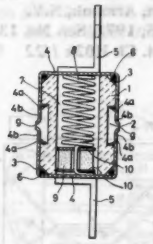
A thermionic cathode comprising a thermionic emissive material consisting essentially of a metal boride, a support consisting essentially of a refractory metal which is reactive with the metal boride and a brazing material bonding the metal boride to the support and acting as a barrier to prevent reaction therebetween.

3,668,458

EXPLOSIVELY ACTUATED GROUND INTERRUPTING DEVICE

Kouhei Irie; Misao Kobayashi, and Masaru Shimamura, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed June 3, 1970, Ser. No. 43,030
Claims priority, application Japan, June 9, 1969, 44/44683; 44/44685; Apr. 24, 1970, 45/39916
Int. Cl. H01j 17/00
U.S. Cl. 313—325 8 Claims



An explosively actuated ground interrupting device for a lightning arrester has an explosive charge which may be detonated by a resistor having a coil-shaped portion which presents a high impedance to transient currents, thereby inhibiting false detonation of the explosive charge.

3,668,459

COUPLED CAVITY SLOW WAVE CIRCUIT AND TUBE USING SAME

Robert S. Symons; Armand Staprans, both of Los Altos, and Robert J. Butwell, San Jose, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Sept. 8, 1970, Ser. No. 70,173
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 6 Claims

A coupled cavity slow wave circuit, such as a cloverleaf circuit, and a microwave tube using same are disclosed. The slow wave circuit includes an array of cavity resonators arranged successively along the beam path with adjacent ones of the cavities having a common end wall structure. A plurality of generally radially directed coupling slots are cut through the common wall between adjacent resonators to form a plurality of axially aligned arrays of coupling slots angularly displaced around the beam path. Each array of slots is angularly displaced about the beam path from the adjacent array by (360/N) degrees where N is the number of axially aligned arrays of slots. Each axially aligned array of coupling slots includes means for interrupting the flow of electrons through the slots such as a blocking member or the slots are staggered or offset in radial or angular position such as to block off a line-of-sight path parallel to the beam through at least a portion of each array of coupling slots to inhibit cumulative electromagnetic interaction between undesired beamlets in the arrays of slots and the fields of the slow wave circuit, whereby the efficiency and stability of the tube are increased.

3,668,460

COALESCED MODE COUPLED CAVITY SLOW WAVE TUBE

Bertram G. James, Redwood City, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Nov. 16, 1970, Ser. No. 89,670
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 5 Claims

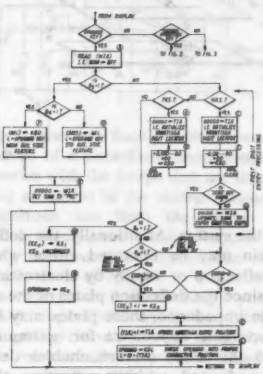
A coupled cavity coalesced mode slow wave tube is disclosed. In the tube, the slow wave circuit is formed by a succession of cavity resonators coupled together via the intermediary of coupling slots. The coupling slots are dimensioned or tuned to have a resonant frequency substantially at the upper band edge frequency of the cavity mode to coalesce the slot mode and the cavity mode frequencies at the band edge, thereby increasing the passband of the circuit. At least two sets of such coupling slots are provided throughout the circuit. Each set of such slots is disposed with their centers in substantial alignment with a line substantially parallel to the axis of the beam. Provision of the plural sets of slots substantially reduces the slot impedance of the circuit, thereby substantially increasing the operating bandwidth of the circuit as compared to a similar circuit employing only one set of in-line coupling slots.

3,668,461

OUTPUT DISPLAY FOR USE WITH A CALCULATOR

Thomas E. Osborne, San Francisco, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.

Original application June 23, 1966, Ser. No. 559,887, now Patent No. 3,566,160, dated Feb. 23, 1971. Divided and this application May 21, 1969, Ser. No. 826,613
Int. Cl. H01j 29/52
U.S. Cl. 315—22 23 Claims



Right, left, and down deflection circuits are coupled to a cathode ray tube for deflecting a normally-off cathode ray beam of the tube along coordinate horizontal and skewed vertical axes in a recurring pattern of two rows of interconnected E's with contiguous segments of each E being traced in succession. Every segment on a horizontal axis is traced by holding the left and down deflection circuits in whatever state they are then in while the right deflection circuit deflects the cathode ray beam to the right along that horizontal axis, and every segment on a skewed vertical axis is traced by restoring the right deflection circuit and maintaining it in its restored state while the left and down deflection circuits simultaneously deflect the cathode ray beam down and to the left along that skewed vertical axis. The down deflection circuit is restored after each E in the second row has been traced, and the left deflection circuit is restored after the last E of the pattern has been traced. A control circuit is coupled to the cathode ray tube for selectively turning the cathode ray beam on while it is being deflected in the above-described pattern to form a display of two rows of numbers in decimal form. The control circuit reads each number in binary coded form from a memory during two different memory access cycles and decodes it into a control signal for turning the cathode ray beam on while selected segments of a pair of adjacent E's in the same row are being traced to form the number in decimal form.

3,668,462

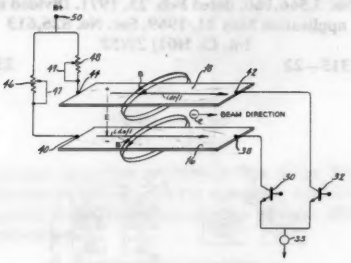
CATHODE RAY TUBE DEFLECTION SYSTEM UTILIZING ELECTROMAGNETIC AND ELECTROSTATIC BEAM DEFLECTION

Robert R. Sinusas, West Caldwell, N.J., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1970, Ser. No. 100,607
Int. Cl. H01j 29/72
U.S. Cl. 315—23 12 Claims

A deflection system for electrically charged particle beams and having at least first and second deflection plates therein

between which the charged particle beam passes. Selected locations on each of the first and second deflection plates are driven by a source of deflection signals, and a load circuit is connected between other selected locations on the first and second deflection plates. The deflection signals applied to the deflection plates establish both an electromagnetic and an electrostatic field between the deflection plates, and the combined force of these fields is utilized to deflect the charged particle beam and thus provide maximum deflection



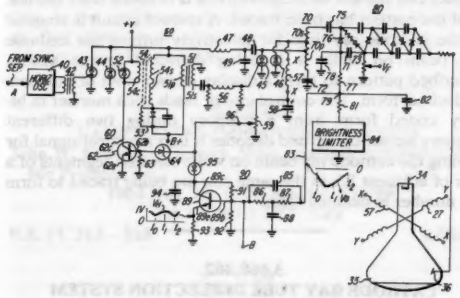
sensitivity for the system. Additionally, the deflection system disclosed herein may be operated either wholly be electromagnetic deflection or wholly by electrostatic deflection. Furthermore, since the deflection plates of the system exhibit a characteristic impedance, these plates may be terminated in their characteristic impedance for optimum system performance; and the latter feature enables deflection plate length to be adjusted without affecting the frequency response of the system.

3,668,463

RASTER CORRECTION CIRCUIT UTILIZING VERTICAL DEFLECTION SIGNALS AND HIGH VOLTAGE REPRESENTATIVE SIGNALS TO MODULATE THE VOLTAGE REGULATOR CIRCUIT

Lawrence Edward Smith, and Robert Joseph Gries, both of Indianapolis, Ind., assignors to RCA Corporation

Filed May 15, 1970, Ser. No. 37,781
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **11 Claims**



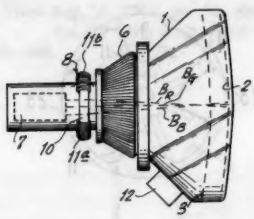
A raster correction circuit for a television receiver combines vertical deflection rate signals and high voltage representative signals and couples them to a control transistor which varies the bias on a regulator transistor to vary the energy supplied to the deflection circuit during each raster field in a manner to correct for side pincushion distortion.

3,668,464

DEFLECTION COMPENSATION FOR TEMPERATURE CHANGES IN A COLOR PICTURE TUBE

Tetsuo Tokita; Yuzo Fuse, and Yoshiharu Katagiri, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 11, 1970, Ser. No. 10,369
Claims priority, application Japan, Feb. 20, 1969, 44/12463
Int. Cl. H01j *29/70*
U.S. Cl. 315—24 **8 Claims**



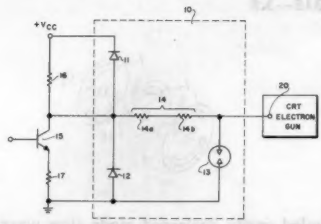
In a color picture tube having an apertured beam selecting grill or mask through one or more electron beams are made to land on predetermined color phosphors applied to the face plate of the tube, thermal expansion of the grill or mask is compensated for, so as to avoid mislanding of the beam or beams, by providing an auxiliary magnetic deflection means located in back of the main magnetic deflection or scanning means and operative in dependence on the operation of the main deflection means to produce magnetic flux in opposition thereto. The current flowing in the auxiliary magnetic deflection means is decreased with increasing temperature by means of a thermosensitive magnetic means so as to similarly decrease the magnetic flux opposing that of the main deflection means, whereby the effective center of deflection of the beam or beams is shifted rearwardly in response to increasing temperature.

3,668,465

SURGE VOLTAGE PROTECTION FOR CATHODE RAY TUBE DRIVERS

William E. Evans, Garland, and Robert C. Harding, Dallas, both of Tex., assignors to Seaco Computer-Display Incorporated, Garland, Tex.

Filed Feb. 16, 1971, Ser. No. 115,535
Int. Cl. H04b *41/36*
U.S. Cl. 315—107 **7 Claims**

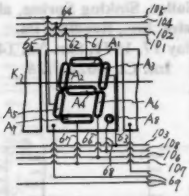


Disclosed in a transient voltage protective network for protecting the transistor of a video amplifier coupled to one of the input terminals of a CRT electron gun from the arcing voltages appearing at this input terminal, the protective network including a pair of diodes respectively connected to the output of the transistor and the collector supply voltage and ground terminals thereof, as well as surge voltage protective device coupled through resistive means across one of the diodes.

3,668,466
ELECTRON TYPE FLUORESCENT DISPLAY DEVICE WITH PLANAR ADJACENT CONTROL ELECTRODE

Satoshi Shimada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 13, 1970, Ser. No. 27,713
Claims priority, application Japan, Apr. 17, 1969, 44/29863; Apr. 12, 1969, 44/29865
Int. Cl. H05b 37/02
U.S. Cl. 315—169 TV 6 Claims

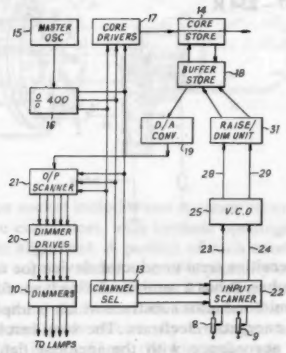


An electron tube having at least two electrodes and a cathode disposed within an evacuated envelope. One of the electrodes is spaced generally transversely with respect to the electro beam path from the cathode to the other electrode. The electrode which is spaced from the electron beam path is used to control the cathode current. Means are provided to couple various voltages to the respective electrodes to accomplish the desired control. The anode electrode may have a phosphor coating thereon so as to glow when bombarded by an electron beam from the cathode. Accordingly, an electron tube of this type is adaptable to display units for the display of letters, symbols, numerals and the like. In one form of the invention, the anode electrode and the control electrodes are arranged in a predetermined pattern to cause elemental areas of the anode electrode to glow and produce a display.

3,668,467
LIGHTING CONTROL APPARATUS WITH A SIGNAL SWITCHING MATRIX

Anthony Leonard Isaac, London, England, assignor to Thorn Electronics, Limited, London, England

Continuation of Ser. No. 677,215, Oct. 23, 1967.
Filed July 2, 1970, Ser. No. 56,111
Claims priority, application Great Britain, Oct. 21, 1966, 47,340/66
Int. Cl. H05b 37/02
U.S. Cl. 315—292 5 Claims

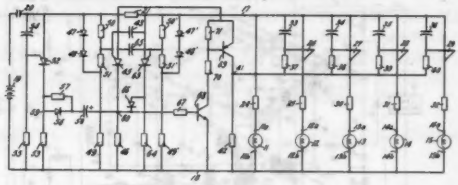


A light dimming system comprises: a plurality of lamps, a dimmer associated with each lamp, a controller for furnishing signals for controlling the brightness or the rate of change of brightness of each lamp and a signal switching matrix for selecting the proper signal for each dimmer.

3,668,468
SOLID STATE CIRCUITS FOR GUARANTEED SEQUENTIAL FLASHING OF PHOTOFLASH LAMP ARRAY

William P. Kornrumpf, Schenectady, N.Y., and Paul T. Cote, Cleveland Heights, Ohio, assignors to General Electric Company

Filed Dec. 16, 1968, Ser. No. 793,636
Int. Cl. G03b 15/04; H05b 37/04, 41/34
U.S. Cl. 315—323 14 Claims

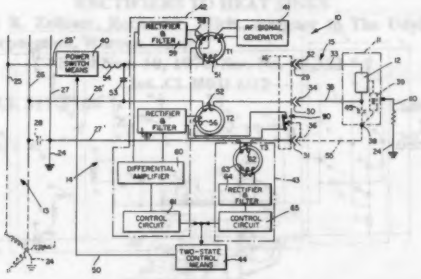


A solid state guaranteed flash circuit for sequentially flashing a linear array of n photoflash lamps employs solid state thyristors in series with the lamps that are turned on sequentially following actuation of the shutter release in a time interval a magnitude less than the shutter opening, the sequencing being interrupted when a lamp is fired. A series current sensing impedance in combination with a thyristor senses the application of current to a continuous filament, while a second current or light sensing thyristor senses the flashing of good lamps. Either sensor can interrupt and reset the series RC gating circuits for the lamp circuit thyristors, but the first is released after a predetermined interval sufficient to sense a good lamp. When a shorted-circuited lamp or air lamp is sensed, the timing cycle restarts and the next lamp in the array is flashed while the shutter is still open.

3,668,469
MONITOR FOR RECEPTACLE WITH TWO OR THREE CONTACTS

Joo C. Lee, Lindenhurst, Ill., assignor to The Safety Company, St. Charles, Ill.

Filed Dec. 21, 1970, Ser. No. 100,103
Int. Cl. H02h 1/02
U.S. Cl. 317—18 D 14 Claims



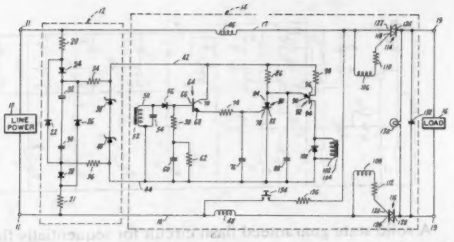
A monitoring module associated with a three-contact receptacle injects an RF supervisory signal into the line contact. When a power cable with a two-contact plug is inserted into the receptacle, a ground fault in the electrical equipment served by the cable provides an alternate path to ground for the injected RF supervisory signal thus reducing the RF current flow in the neutral contact. Such reduction is sensed in a differential amplifier and used to disconnect power. When a power cable with a three-contact plug is used, a discontinuity in the ground path reduces the RF current flow in the ground contact due to the injected RF signal. This reduction is sensed and used to disconnect power.

3,668,470

DEVICE FOR DETECTION AND CONTROL OF CURRENT LEAKAGE

Edward Curtis Ambler, Newington, and Andrew E. Scoville, Ellington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 28, 1970, Ser. No. 101,534
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **7 Claims**



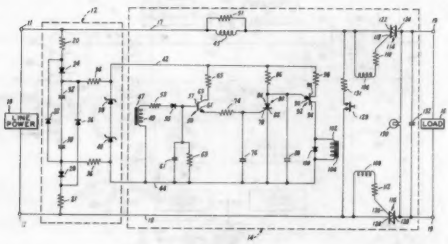
A protective device for connection to the conductors between an associated electrical power supply and an associated electrical load detects electrical leakage from the load. Solid state devices in the protective device are rendered conductive or nonconductive in response to an error signal produced by a differential transformer when there is imbalance between conductors. The amplified error signal is applied to the gate of a silicon controlled rectifier which shorts the power furnished to a unijunction transistor oscillator. The shorting action terminates a pulse trigger supply to the solid state devices to render them nonconductive.

3,668,471

DEVICE FOR DETECTION AND CONTROL OF LEAKAGE AND EXCESSIVE CURRENT FLOW

Edward Curtis Ambler, Newington; Walter R. Bush, West Simsbury, and Andrew E. Scoville, Ellington, all of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 28, 1970, Ser. No. 101,748
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **14 Claims**



A protective circuit device for connection between an associated electrical power supply and an associated electrical load which detects excessive current drawn by the load. Solid state devices in the protective device are rendered conductive or nonconductive in response to a signal produced by a current transformer. The amplified signal is applied to the gate of a silicon controlled rectifier which shorts power going to a unijunction transistor oscillator. The shorting action terminates a pulse trigger supply to the solid state devices to render them nonconductive.

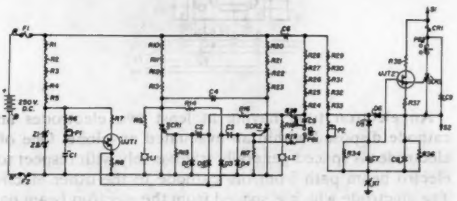
In one embodiment, the protection device also detects electrical leakage from the load by means of a differential transformer which produces an error signal when there is current imbalance between conductors from the line supply. The amplified differential transformer secondary voltage is applied to the gate of the silicon controlled rectifier to cause the solid state devices to become nonconductive.

3,668,472

GROUND DETECTION CIRCUIT FOR A D.C. DISTRIBUTION NETWORK

William B. Shields, Reading; Victor H. Willems, Shillington, and William F. Sailer, Sinking Spring, all of Pa., assignors to Gilbert Associates, Inc., Reading, Pa.

Filed May 17, 1971, Ser. No. 144,066
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 R **8 Claims**



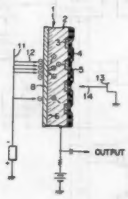
The invention relates to a ground detection circuit for an ungrounded D.C. distribution network. The sensitivity to ground is uniquely independent of polarity of the D.C. bus on which the ground occurs. The occurrence of multiple grounds will cause the ground detection circuit to operate as if all such ground resistances were in parallel with each other. The principle of detection is based on the fact that the algebraic sum of currents flowing through a resistance, having one end connected to ground and the other end being alternately connected to the plus and then to the minus bus of the center tap battery source, is inversely proportional to the "total resistance" to ground of the network, where "total resistance" is the equivalent of placing all resistances to ground in parallel.

3,668,473

PHOTOSENSITIVE SEMI-CONDUCTOR DEVICE

Shoichi Miyashiro, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 23, 1970, Ser. No. 49,006
Claims priority, application Japan, June 24, 1969, 44/49369; July 29, 1969, 44/58028
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R **8 Claims**



A photosensitive semi-conductor device for use as a target of camera tubes. It has a semi-insulating layer formed on that side of a semi-conductor substrate which is impinged by light photons or energetic electrons. The semi-insulating layer is charged in accordance with the incident light photons or energetic electrons, and the electric field set up across the semi-insulating coating layer by the bombardment of light photons and energetic electrons has an effect of controlling the motion of minority carriers to automatically control the input-output photoelectric conversion gain of the photosensitive semi-conductor device.

3,668,474

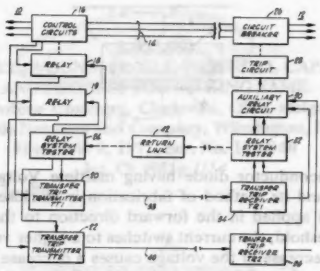
APPARATUS FOR AUTOMATIC RELAY SYSTEM TESTING

Marion D. Knox, Oklahoma City, Okla., assignor to Wayne Electronic Products Company, Oklahoma City, Okla.

Continuation-in-part of application Ser. No. 19,869, Mar. 16, 1970. This application Oct. 19, 1970, Ser. No. 81,694

Int. Cl. G01r *15/12*; G08b *1/08*

U.S. Cl. 317—28 R 11 Claims



Apparatus for periodic testing of multiple-terminal, remote trip, dual transfer trip relaying systems. The apparatus consists of periodically actuatable test units which provide a plurality of program outputs to effect transmission tests of transfer trip channels as well as proper operation of the associated relay equipment. A master test unit located at a first position initiates operation and functions with one or more slaved remote test units to key transmissions and verify reception at the transfer trip receiver equipment, while test signification is made in accordance with programmed requirement via an associated return communications link.

3,668,475

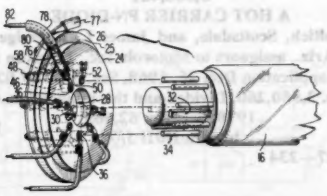
KINESCOPE SOCKET

Raymond Clyde Owens, Carmel, and Lucius Ponder Thomas, Indianapolis, both of Ind., assignors to RCA Corporation

Filed Dec. 24, 1970, Ser. No. 101,357

Int. Cl. H02h *1/04*

U.S. Cl. 317—61.5 15 Claims



A kinescope socket includes two sections secured together by conductive connectors, with keyhole openings in each of the sections in alignment. A portion of each conductive connector is held captive within one of a plurality of kinescope pin receptacles in the first section. The other section has a conductive pattern on one of its surfaces. The pattern includes conductive pads electrically connected to pins of a kinescope when inserted into the kinescope pin receptacles by a second portion of the conductive connector. The second portion passes through the two sections and is connected by a conductive strap to the first portion. The conductive pattern also includes a conductive area adjacent to, but separated from, the conductive pads to provide an arc gap therebetween.

3,668,476

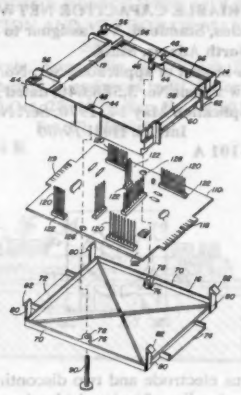
SELF-LOCKING ENCLOSURE FOR ELECTRONIC CIRCUITRY AND METHOD OF ASSEMBLING THE SAME

James Adam Wrabel, Chicago, and Casimer Joseph Dabrowski, Mount Prospect, both of Ill., assignors to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed Sept. 11, 1970, Ser. No. 71,583

Int. Cl. H02b *1/02*

U.S. Cl. 317—101 DH 13 Claims



Electronic printed circuit boards are positioned in multiple layers within a hollow plastic body having self-locking sections which are snapped into place entirely enclosing the circuit boards within the enclosure. Locking screws are passed through all of the sections and a seal is placed over the screws to prevent unauthorized opening of the enclosure and tampering with the circuitry contained therein. Openings are provided in the enclosure for electrical connections to extend through the wall of the enclosure to provide input signals to and extract output signals from the circuits contained therein.

3,668,477

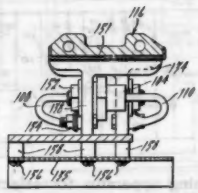
MOUNTING BRACKET FOR SEMICONDUCTOR RECTIFIERS TO HEAT SINKS

Lynn R. Zellmer, Rochester, Mich., assignor to The Udylite Corporation, Warren, Mich.

Filed Nov. 10, 1970, Ser. No. 88,322

Int. Cl. H01l *1/12*

U.S. Cl. 317—100 6 Claims



This disclosure pertains to a rectifier system which includes a plurality of diodes in the secondary circuit of a main transformer to provide rectification for the energy flowing therefrom, and a plurality of semi-conductive rectifier devices for controlling current to the primary windings thereto. The diodes are stud mounted and adapted to be self locked between a pair of channel portions of an electrically conductive heat sink, whereas the semi-conductive rectifier

devices are stud mounted to extending flange portions of a novel heat sink bracket. The bracket is comprised of a base portion wherefrom is extended from one surface an extending flange. A bore is disposed in the flange portion, a preselected distance from the base, for self lockingly receiving the semi-conductive rectifier device. The bracket itself is fastened to a main heat sink by means of an epoxy which is heat conductive and electrically insulated.

3,668,478

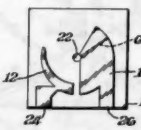
VARIABLE CAPACITOR NETWORK

John H. Fabricius, Stamford, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of application Ser. No. 880,529, Nov. 28, 1969, now Patent No. 3,588,640, dated June 28, 1971. This application May 14, 1970, Ser. No. 37,083

Int. Cl. H01l *19/00*

U.S. Cl. 317—101 A **15 Claims**



A continuous electrode and two discontinuous electrodes, made up of a plurality of isolated islands, are arranged over at least a pair of lower electrodes with an intervening film of dielectric material. Terminal connection is provided to the lower electrodes and to the upper continuous electrode. A slidable contact member provides bridging contact between the continuous upper electrode and selected island areas of either of the adjacent discontinuous electrodes to provide a network having two variable capacitors and a fixed capacitor. Additionally, deposited resistors are disposed alongside the electrodes in connection to at least one of the terminals to provide fixed and variable resistors of the network.

3,668,479

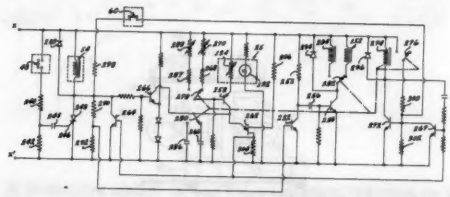
ELECTRONIC TIMING APPARATUS

Murray Weston; Dennis Anderson, both of Northridge, and Steve Cole, Van Nuys, all of Calif., assignors to Weston Murray, Northridge and Fred Fisher, Van Nuys, Calif., part interest to each

Filed June 22, 1970, Ser. No. 48,281

Int. Cl. G07f *11/08*; H01h *47/18*

U.S. Cl. 317—141 S **6 Claims**



Electronic timing apparatus for selectively actuating an electro-mechanical device such as a solenoid for either of two distinct predetermined periods of time with a first period being the normal period of actuation and a second period capable of being selectively substituted for the first period for the next following actuation of the electro-mechanical device and then automatically replaced with the first period unless another selective substitution is made for the next following actuation. Each period of time is capable of being varied within a limited predetermined range in response to a change in an external physical condition such as pressure.

3,668,480

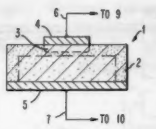
SEMICONDUCTOR DEVICE HAVING MANY FOLD IV CHARACTERISTICS

Leroy L Chang, Tarrytown, and Leo Esaki, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 21, 1970, Ser. No. 57,383

Int. Cl. H01l *3/14*

U.S. Cl. 317—234 **22 Claims**



A semiconductor diode having multiple Voltage characteristics and its method of fabrication is disclosed. When a voltage is applied in the forward direction to the diode, at some threshold, the current switches to a higher value of current. A decrease of the voltage causes a decrease in the current and, after a reverse voltage applied, reverse current values of increasing magnitude are obtained until a threshold is reached. When the threshold is reached, the diode switches from a high value of reverse current to a lower value of reverse current. A decrease in the reverse voltage to zero, reduces the current to zero and, increasing the voltage in the forward direction starts the above-described cycle over again. By adjusting the forward and reverse voltages, switching may occur at values higher than the thresholds and a family of voltage-current characteristics is obtained. A typical device consists of n-conductivity type gallium arsenide into which a region of deep centers has been diffused. A typical deep center of oxygen. A semiconductor junction which is alloyed, diffused or of the Schottky barrier type is formed with the deep center region. Where the junction formed is of the alloyed type, for example, an indium-zinc alloy may be used. Finally, an ohmic contact of gold-tin is applied to the semiconductor body. Forward voltages in the neighborhood of 1 volt provide switching in the forward direction while reverse voltages of as little as 3 volts cause switching in the reverse direction. A diode fabrication technique is also disclosed.

3,668,481

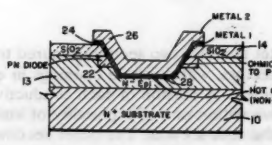
A HOT CARRIER PN-DIODE

Jack L. Saltich, Scottsdale, and James L. Rutledge, Tempe, both of Ariz., assignors to Motorola Inc., Franklin Park, Ill.

Original application Dec. 26, 1968, Ser. No. 787,024, now Patent No. 3,550,260. Divided and this application Aug. 10, 1970, Ser. No. 62,665

Int. Cl. H01l *5/02*

U.S. Cl. 317—234 **5 Claims**



Disclosed is a Schottky barrier or hot carrier diode and process for making same wherein a diffused PN junction and a Schottky barrier junction are both formed in a body of semiconductor material. The diffused PN junction is formed by first diffusing an impurity through an opening in a diffusion mask and into one surface of the semiconductor body to form PN junction. Next, a large central portion of the region

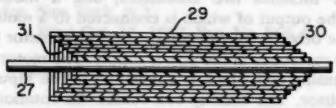
formed by the above diffusion is removed by etching or cutting, leaving unaffected by the etchant only that portion of the diffused region underlying and adjacent to the diffusion mask on the surface of the semiconductor body. The latter portion of the diffused region forms a relatively small area diffused PN junction. Finally, a Schottky barrier junction is formed in the etched out area of the semiconductor body, and the diode including the diffused and Schottky barrier junctions has a near-ideal current-voltage characteristic and still maintains its fast recovery time.

3,668,482

AN OFFSET, WOUND, SINGLE-WEB ROLL CAPACITOR AND PROCESS FOR MAKING SAME

David Johnstone Chalmers, Circleville, Ohio, assignor to E.I du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1971, Ser. No. 113,848
Int. Cl. H01g 1/14
U.S. Cl. 317—260 **7 Claims**



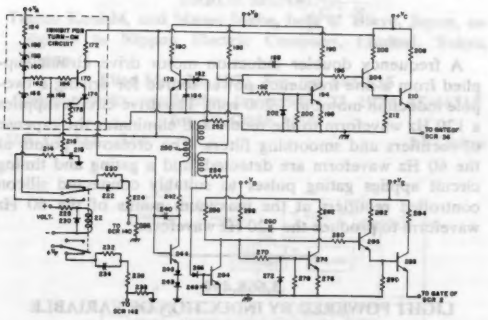
An electrical capacitor comprising a single web of a metallized dielectric convolutely wound and having a metal coating on the terminal ends with an electrical connector attached to the metal coating, wherein the terminal connection between the metallized portion of the capacitor serving as an electrode and the metal coatings on the terminal ends is improved by offsetting the exposed edge portions of the layers formed by the convolutely wound web at the terminal ends with respect to each other.

3,668,483

DIRECT CURRENT SOLID STATE CIRCUIT BREAKER

Carl W. Kellenbenz, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 19, 1971, Ser. No. 173,055
Int. Cl. H02h 3/08, 7/00
U.S. Cl. 317—33 SC **8 Claims**



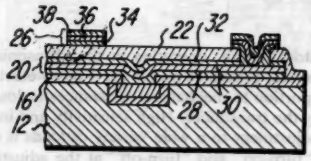
The present invention relates to a solid state circuit breaker for use in DC circuitry associated with deep submergence vehicles. The device includes a pair of high current silicon controlled rectifiers to break both sides of the direct current power lines. The device further includes current sensing means to sense over-current conditions, a capacitive discharge turn-off circuit for driving the SCR to the nonconductive state, and an inhibit circuit for preventing turn-on of the SCR's when the capacitor in the turn-off circuit is not fully charged. Further, the system includes a low voltage remote control circuit to allow turn-on and turn-off of the SCR's without the danger of having high voltage leads within the submerged vehicle.

3,668,484

SEMICONDUCTOR DEVICE WITH MULTI-LEVEL METALIZATION AND METHOD OF MAKING THE SAME

William John Greig, Somerville, and Ralph Robert Soden, Mendham, both of N.J., assignors to RCA Corporation

Filed Oct. 28, 1970, Ser. No. 84,581
Int. Cl. H01l 5/02
U.S. Cl. 317—234 R **4 Claims**



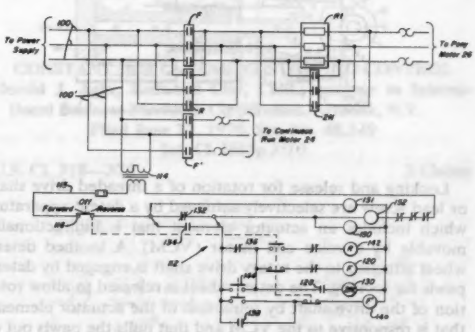
A semiconductor body has thereon a first level metalization pattern, a layer of an electrical insulating material on the body and covering the first level metalization pattern, and a second level metalization pattern on the insulating material layer and extending through at least one opening in the insulating material layer to contact the first level metalization pattern. Each of the metalization patterns includes a film of titanium, a film of platinum over the titanium film and a film of gold over the platinum film. The first level metalization pattern has an opening in the gold film in alignment with each of the openings in the dielectric layer so that the titanium film of the second level metalization pattern contacts the platinum film of the first level metalization pattern.

3,668,485

DRIVE FOR BELT CONVEYORS

Melvin N. Norris, 328 Crestview Dr., Franklin, Pa.

Filed July 2, 1969, Ser. No. 838,468
Int. Cl. H02p 1/58
U.S. Cl. 318—102 **16 Claims**



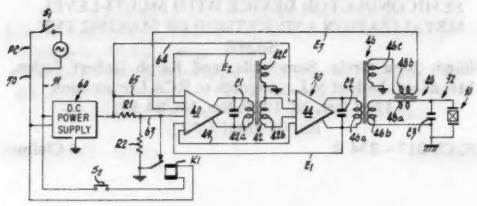
A method and apparatus of accelerating a belt conveyor wherein such acceleration is accomplished by means of sequential operation of two drive motors connected in tandem.

3,668,486

LOAD-SENSITIVE GENERATOR FOR DRIVING PIEZOELECTRIC TRANSDUCERS

Joseph Silver, Levittown, Pa., assignor to Crest Ultrasonics Corporation, Trenton, N.J.

Filed Jan. 8, 1971, Ser. No. 104,957
Int. Cl. H01v 7/00
U.S. Cl. 318—116 9 Claims



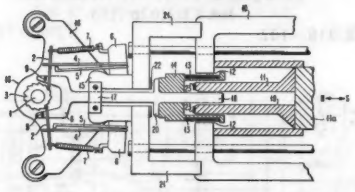
An oscillatory circuit, operating in the ultrasonic or high sonic frequencies, generates power for a piezo-electric transducer in proportion to mechanical resistances or loadings encountered by the transducer. High sensitivity and instantaneous power adjustment to a wide variety of loads is obtained, and instant "turn-on" and "turn-off" at the adjusted power settings are secured, by a circuit in which the input to the first stage of a two-stage oscillatory circuit comprises the sum of three feedback components plus a DC forward bias.

3,668,487

ELECTROMAGNETIC ACTUATED DETENT APPARATUS

David E. Cuzner, Ampfield; Leo J. Rigbey, Winchester, and George M. Smith, Chandler's Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,273
Claims priority, application Great Britain, June 30, 1970, 31,515/70
Int. Cl. H02k 33/10
U.S. Cl. 318—128 8 Claims



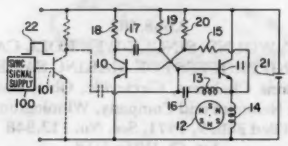
Locking and release for rotation of a threaded drive shaft or lead screw are selectively achieved by a detent apparatus, which includes an actuator element that is bidirectionally movable by a voice coil motor (VCM). A toothed detent wheel attached to the rotary drive shaft is engaged by detent pawls for locking. The detent wheel is released to allow rotation of the drive shaft by retraction of the actuator element, that is responsive to the VCM and that pulls the pawls out of engagement with the detent wheel. Stops limit the path of travel of the actuator element. A pulse generating circuit, in combination with a center-tapped coil of the VCM, provides an inhibit pulse to minimize bounce of the movable actuator element and associated mechanical members.

3,668,488

SYNCHRONOUS TRANSISTOR MOTOR WITH SOURCE VOLTAGE COMPENSATION

Akira Nikaido, Tokyo; Mitsuo Onda, Ohomiya; Fumio Nakajima, Tokyo; Takayasu Machida, Iruma, and Shunji Sudo, Fujimi, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1970, Ser. No. 28,484
Claims priority, application Japan, Apr. 14, 1969, 44/33259
Int. Cl. H02k 29/00
U.S. Cl. 318—138 10 Claims



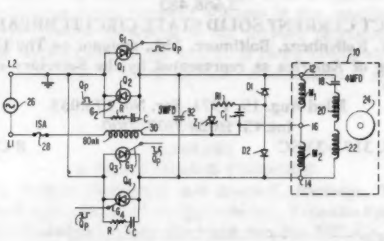
A small synchronous transistor motor designed for low power consumption to be used in devices such as time pieces. The motor includes two transistors, one a motor drive transistor the output of which is connected to a motor drive coil and the other a voltage compensating transistor to compensate for variations in the power supply. The motor also includes a sensing coil which is connected to the input of the drive transistor. The sensing coil senses the rotation of the rotor of the motor and a synchronizing signal which is applied to the motor, the sensing coil thereby maintaining the rotor in synchronism with the synchronizing signal.

3,668,489

FREQUENCY DOUBLER MOTOR DRIVE AND MOTOR

David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company

Filed Apr. 16, 1971, Ser. No. 134,630
Int. Cl. H02p 7/42
U.S. Cl. 318—227 9 Claims



A frequency doubler induction motor drive circuit supplied from a line frequency power source for driving a two-pole induction motor at 7,200 rpm. The drive circuit supplies a 120 Hz waveform to the motor and eliminates the expense of rectifiers and smoothing filters. The crossover points of the 60 Hz waveform are detected, and a gating and timing circuit applies gating pulses to suitably connected silicon controlled rectifiers at the maximum points of the 60 Hz waveform to produce the 120 Hz waveform.

3,668,490

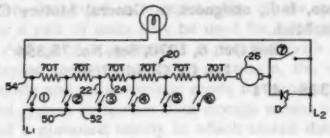
LIGHT POWERED BY INDUCTION OF VARIABLE IMPEDANCE MOTOR

William J. Conlon, New Britain, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Jan. 20, 1971, Ser. No. 107,906
Int. Cl. H02k 23/64; D05b 79/00
U.S. Cl. 318—245 10 Claims

A universal motor field tapped for speed control is serially connected at one end through the armature to one side of an

electrical potential. An operationally interlocked series of ON and OFF switches selectively interconnect the field taps to the other side of the electrical potential and a light bulb



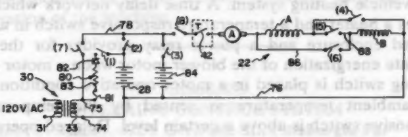
bridges said one side of the electrical potential and the other end of the field for substantially constant illumination of a working area at all speeds without need for a separate light switch.

3,668,491

BATTERY POWERED LIQUIDIZER

Raymond F. Kelley, Palm Beach, Fla., and Roy L. Swanke, Newington, Conn., assignors to Dynamics Corporation of America, New York, N.Y.

Filed Oct. 15, 1969, Ser. No. 866,453
Int. Cl. H02p *7/00*
U.S. Cl. 318—305 **5 Claims**



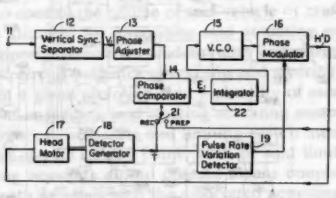
A portable multi-speed liquidizer operable from low voltage alternating or direct current is speed-controlled by a push button switch assembly, which also serves to select the power source for the liquidizer motor. The maximum current switched by any one contact of the assembly is reduced during speed changes by automatically switching the lowest impedance motor field coil into the circuit immediately preceding and during each speed change.

3,668,492

MOTOR DRIVING SERVO SYSTEM COMPRISING AN INTEGRATOR FOR THE QUANTITY RELATING TO THE ERROR SIGNAL

Tatsuo Konishi, and Masao Inaba, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 20, 1971, Ser. No. 145,335
Claims priority, application Japan, May 23, 1970, 45/44315
Int. Cl. G05b *11/42*
U.S. Cl. 318—314 **12 Claims**



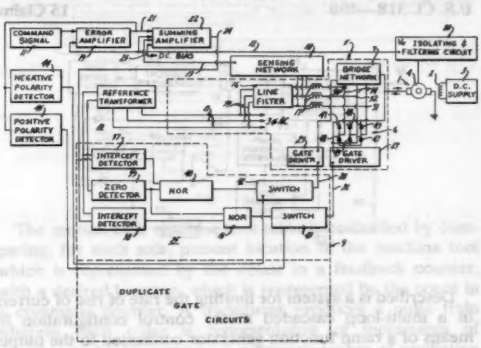
The servo system having a phase comparator for producing an error signal representative of the phase difference between an input reference periodic signal and an oscillatory signal for driving a motor. A voltage controlled oscillator controlled by the error signal to produce the oscillatory signal is provided with an integrator for integrating the error signal to produce an integration signal proportional to the result of the integration of the error signal and therefore to hold the instantaneous value of the integration signal when the error signal becomes zero. The integration signal is supplied to the oscillator in place of the error signal. the servo system is suitable for the drum and the capstan servos of rotary-head video tape recorders.

3,668,493

DYNAMOELECTRIC CONTROL CIRCUIT

John T. Maynard, New Berlin, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 20, 1970, Ser. No. 39,019
Int. Cl. H02p *5/16*
U.S. Cl. 318—345 **8 Claims**



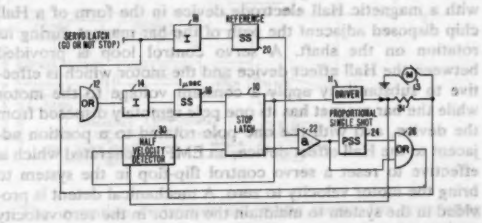
A D.C. shunt motor has the armature connected to a three-phase supply through a pair of parallel connected full-wave rectifier bridges, each having silicon controlled rectifiers in each leg. A separate NOR logic circuit controls gating of each rectifier in accordance with the proper half cycle of the applied voltage and at the desired phase angle to establish a predetermined energization level. The firing is determined by an intercept detector having a separate channel for each phase. Each channel is connected through a lag filter and a lead filter directly to the corresponding phase winding of a reference transformer to supply to the channel a voltage directly derived from the line-to-line voltage applied to the corresponding rectifier. The input to each channel is connected across a center tapped reference transformer winding and the junction of a resistor and capacitor connected across the winding. A D.C. control voltage is applied to the channels to establish a control signal pulse at the proper phase angle of the rectifier-applied voltage.

3,668,494

CONSTANT DISPLACEMENT STOPPING CONTROL

Gerald J. Agin, Redwood City, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 22, 1970, Ser. No. 48,249
Int. Cl. H02p *3/10*
U.S. Cl. 318—373 **3 Claims**



Stopping of a d-c servo motor is effected in two phases,

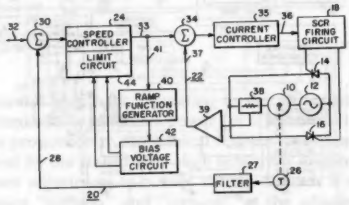
during the first of which the velocity is brought to half its initial value after initiation by a stop signal. A reference single shot and a proportional single shot determine the timing of the second phase, these circuits acting together to generate a stopping waveform which traverses a constant displacement, independent of motor deceleration rate.

3,668,495

APPARATUS FOR LIMITING THE RATE OF RISE OF CURRENT IN A MULTI-LOOP MOTOR CONTROL SYSTEM

Hermann Eisele, Pittsburgh, Pa., and Colin E. Huggett, Torrance, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1970, Ser. No. 86,809
Int. Cl. H02p *1/04*
U.S. Cl. 318—400 **15 Claims**



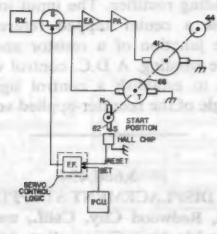
Described is a system for limiting the rate of rise of current in a multi-loop cascaded motor control configuration by means of a ramp function generator connected to the output of a motor controller, for example, a speed controller, whose output acts as a reference to a current loop.

3,668,496

SINGLE REVOLUTION CRANK SYSTEM

Ivan N. Markowitz, Framingham, and Robert G. Bower, Concord, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 4, 1970, Ser. No. 95,182
Int. Cl. G05g *5/00*
U.S. Cl. 318—466 **8 Claims**



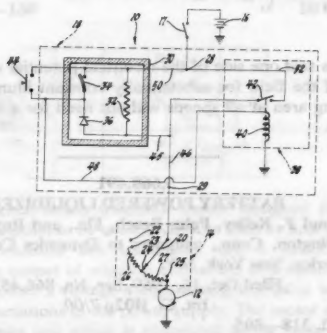
A single revolution crank system is provided for a DC motor, having a Hall effect sensing device employed as a position sensor. A bar magnet is attached to the DC motor shaft, with a magnetic Hall electrode device in the form of a Hall chip disposed adjacent the path of the bar magnet during its rotation on the shaft. A servo control loop is provided between the Hall effect device and the motor which is effective to substantially apply a constant voltage to the motor while the bar magnet has its one pole remotely disposed from the device, and with the one pole rotated to a position adjacent to the Hall effect device, an EMF is generated which is effective to reset a servo control flip-flop in the system to bring the motor velocity to zero. A mechanical detent is provided in the system to maintain the motor in the zero velocity position.

3,668,497

HEATER BLOWER MOTOR DELAY ENERGIZING MEANS

Ronald D. Freiberger, and James L. Woolley, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 6, 1970, Ser. No. 78,354
Int. Cl. G05d *23/30*
U.S. Cl. 318—471 **6 Claims**



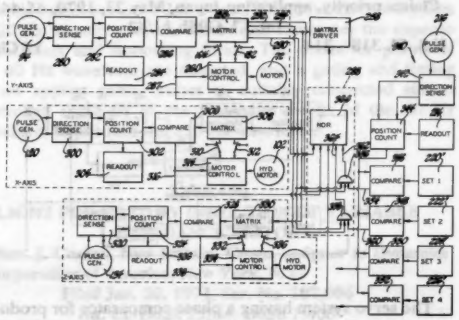
Apparatus for controlling the operation of a blower motor in a vehicle heating system. A time delay network which includes a heater and a temperature responsive switch in an insulated enclosure and a power relay provides for the immediate energization of the blower motor when a motor controlling switch is placed in a motor operative condition and the ambient temperature as sensed by the temperature responsive switch is above a certain level. Delayed operation of the blower motor is provided when the ambient temperature is below the certain level, the delay continuing until the interior temperature of the enclosure is raised above the certain temperature by the heater when the motor controlling switch is placed in the motor operative setting. An override switch is provided for effecting immediate operation of the blower motor when the ambient temperature is below the certain level if desired by the vehicle occupant so as to provide for immediate defrosting of the vehicle windows.

3,668,498

TRANSFER APPARATUS WITH DIGITAL PATH CONTROL

Albert A. Austin, Jr., Grand Blanc, Mich., assignor to Atlas Automation, Inc., Fenton, Mich.

Filed Apr. 20, 1971, Ser. No. 135,700
Int. Cl. G05b *19/42*
U.S. Cl. 318—568 **24 Claims**



Transfer apparatus is disclosed for use with a cyclically operated material processing machine such as a power press

or the like. The apparatus comprises a transfer unit which includes a workpiece holder with separate drive means for displacement along horizontal and vertical axes and, if desired, for rotation about a third axis. A transfer unit may be mounted on the input or output side of the processing machine or a pair of units may be used for loading and unloading if desired. A transfer unit is provided with a control system adapted for two modes of operation, the set up or teaching mode and an automatic mode for production runs. The control system comprises data storage means suitably in the form of a pinboard matrix in which stored data defines coordinates of selected points on a predetermined transfer path and the direction and velocity of movement between successive points. During the teaching mode of operation a manual controller enables an operator to move the transfer unit stepwise through a cycle of operation on a trial basis to establish the transfer path and the accelerations and velocities of the workpiece holder. The data storage means includes manually settable elements which enable the operator to store the necessary data for a given segment of the transfer path when a trial movement is satisfactory. When all of the control data is established in the storage means for the entire transfer path the control means are switched to automatic operation and the apparatus is ready for production operation. Since the transfer apparatus has its own drive means it need not be integrally connected with the mechanism of the processing machine. Instead of timing signal generator connected with the control system provides for synchronization of the movements of the transfer apparatus with the cyclic operation of the machine.

3,668,499

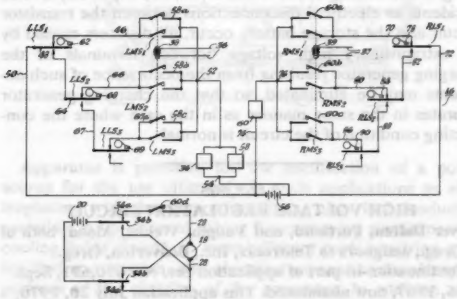
STEERING CONTROL SYSTEM

Norbert P. Malloy, 5231 Gertrude St., Pittsburgh, Pa.

Filed Apr. 27, 1970, Ser. No. 32,224

Int. Cl. G05d *1/08*

U.S. Cl. 318—587 **16 Claims**



An automatic steering control system for use with a steerable vehicle or other craft having a steering mechanism, the combination comprising reversible steering actuating means for displacing said steering mechanism in relatively opposite directions to control the course of said vehicle or craft, steering control circuitry for energizing said actuating means in relatively opposite directions, said circuitry comprising a plurality of first circuit paths for energizing said steering actuating means in a given direction, and a plurality of second circuit paths for energizing said steering actuating means in the opposite direction, actuating and limiting switch means coupled in each of said circuit paths, each of said limit switch means having normally closed contact means coupled in its associated path in series with the associated actuating switch means and normally open contact means coupled to an adjacent one of said circuit paths so that said circuit paths can be energized successively for incremental operation of said steering actuating means in a given direction upon repeated and simultaneous actuation of all of the actuating switch means corresponding to such directional operation.

3,668,500

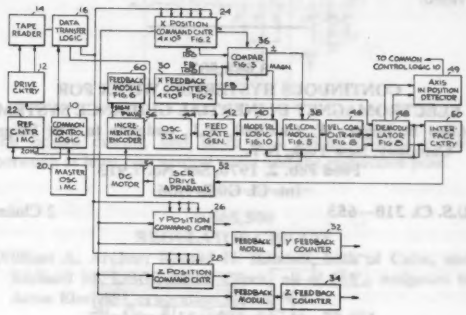
NUMERICAL SERVO MOTOR CONTROL SYSTEM

Marion Kosem, Willoughby, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Continuation of application Ser. No. 654,887, July 20, 1967, now abandoned. This application Apr. 1, 1970, Ser. No. 29,365

Int. Cl. G05b *19/28*

U.S. Cl. 318—601 **17 Claims**



The motion of a machine tool table is controlled by comparing, for each axis, present location of the machine tool which is represented by the count in a feedback counter, with a desired location, which is represented by the count in a command counter. A transducer produces a pulse train wherein each pulse is representative of increments of machine tool table motion. A reference source of oscillation feeds pulses to drive the command counter. These pulses are modulated by the pulses from the feedback transducer and then are applied to drive the feedback counter. The difference in time at which both counters attain predetermined counts is sensed and is used to generate signals which control the application of drive signals to the motors which drive the machine tool tables.

3,668,501

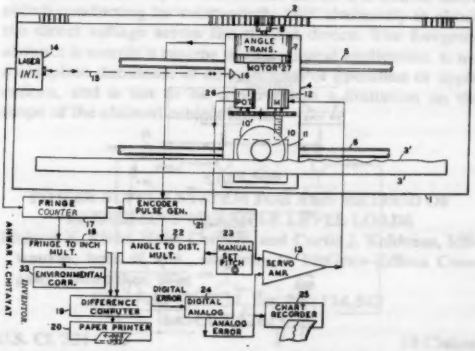
MEANS FOR GENERATING COMPENSATING CONTROL MEANS

Anwar K. Chitayat, Plainview, N.Y., assignor to OPT Omechanisms, Inc., Plainview, N.Y.

Original application June 2, 1969, Ser. No. 835,873, now Patent No. 3,605,552. Divided and this application Dec. 2, 1970, Ser. No. 94,512

Int. Cl. G05d *23/275*

U.S. Cl. 318—632 **10 Claims**



The invention comprises automatic means for generating compensating means for long lead screw and racks such as those used in precision machine tools. The workpiece lead

screw or rack is mounted parallel to the cam to be cut. A movable platform mounts a milling cutter. The platform is also connected to the lead screw by a nut or to the rack by a pinion. Angular motion of the lead screw or pinion is measured and transmitted to a computer. The linear motion of the platform is measured with an interferometer. The two measurements are compared in the computer and the output is fed to a servo mechanism which controls compensating means. A chart or printed or other type tape output is provided.

3,668,502

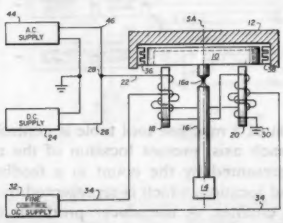
CONTINUOUS HYSTERESIS WIPER FOR ELECTROMAGNET IN INERTIAL GUIDANCE SYSTEM

Allan B. Pilger, W. Caldwell, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,913

Int. Cl. G05b *1/06*

U.S. Cl. 318—653 **2 Claims**



An inertial guidance system wherein one or more electromagnets are placed in a magnetic flux exchange relation with the flywheel of a gyroscope and are adapted to restore the gyroscope to a null position upon a signal from one or more pick-offs. An alternating current is applied to the energizing coils of the electromagnets and is of a magnitude large enough to nullify residual magnetic flux in the electromagnets due to hysteresis.

3,668,503

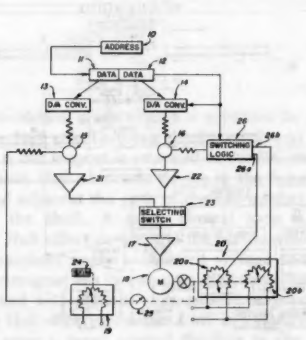
COARSE-FINE DIGITAL SERVO INDICATOR WITH CONTINUOUS ROTATION POTENTIOMETER FEEDBACK IN FINE MODE

Norman J. Lindner, New York, N.Y., assignor to Kollsman Instrument Corporation, Syosset, N.Y.

Filed Nov. 26, 1969, Ser. No. 879,985

Int. Cl. G05b *1/06*

U.S. Cl. 318—665 **9 Claims**



This disclosure deals with a mechanical servo system used to provide accurate digital readout from binary-coded decimal input. The input data is divided into a coarse portion and a fine portion. The coarse feedback portion measures in units of 1,000 feet, while the fine feedback control measures the low order units and consists of two cyclical elements. Each fine element has occasion to pass through a dead band region, but the elements are connected in a ganged relation 180° out of phase, so that when one is at its dead band, the other is at its continuous portion. The selection of a fine feedback element is controlled through a switching circuit and according to a logic equation stored in the input unit.

3,668,504

BATTERY CHARGING VOLTAGE REGULATOR INCLUDING SAFETY CIRCUIT

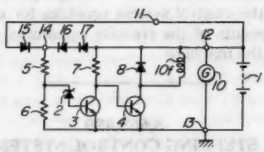
Yoshichi Kawashima, Gifu, Japan, assignor to Nippon Denso Company Limited, Kariya-shi, Japan

Continuation-in-part of application Ser. No. 61,814, Aug. 6, 1970, now abandoned , which is a continuation of application Ser. No. 783,201, Dec. 12, 1968, now abandoned , and a continuation-in-part of 797,010, Feb. 6, 1969, now abandoned. This application Oct. 26, 1970, Ser. No. 83,766

Claims priority, application Japan, Dec. 16, 1967, 42/80827; Feb. 10, 1968, 43/8466

Int. Cl. H02j *7/24*

U.S. Cl. 320—64 **12 Claims**



A charging voltage regulator for a storage battery, in which, an output voltage of a charging generator is controlled to maintain the terminal voltage of a storage battery at a predetermined value by interrupting the field current of the generator using a transistor circuit, and especially if such accidents as electrical disconnections between the transistor circuit and the storage battery occur, all disasters caused by an extraordinary high voltage between terminals of the charging generator resulting from the occurrence of such accidents may be eliminated, so that the charging generator operates in the same manner as in the case where the connecting condition of the circuit is normal.

3,668,505

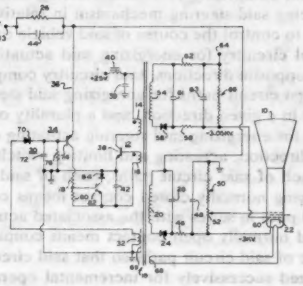
HIGH VOLTAGE REGULATION CIRCUIT

Oliver Dalton, Portland, and Vaughn Weidel, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of application Ser. No. 670,691, Sept. 26, 1967, now abandoned. This application July 20, 1970, Ser. No. 64,014

Int. Cl. H02m *3/32;* H01j *29/70;* H03k *3/30*

U.S. Cl. 321—2 **14 Claims**



A high voltage power supply for a cathode-ray tube includes an oscillator intercoupled with a transformer having a

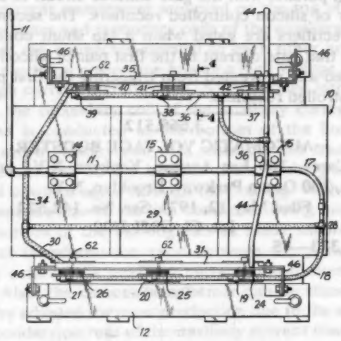
high voltage output winding. An additional low voltage winding on the transformer provides a signal substantially proportional to the high voltage output, and such signal is coupled by way of a peak detector to a control amplifier adapted to vary the d.c. bias value in the oscillator circuit. If the high voltage output tends to drop, the peak detector registers the lower voltage, causing the control amplifier to increase the amplitude of oscillations produced by the oscillator to thereby return the high voltage output toward a predetermined value. Since the low voltage winding does not provide a voltage value which is exactly proportional to the high voltage output, additional circuit means is included in series with the high voltage winding for coupling a current feedback to the control amplifier such that an increase in current drawn from the high voltage winding will also cause an increase in the amplitude of oscillations. By this means the actual high voltage output is closely regulated even though the regulation voltage is acquired at a low voltage level in the circuit.

3,668,506

CURRENT AND FLUID CONDUCTING ARRANGEMENTS

Jack O. Beasley, Holmdel, and Paul J. Mohary, Toms River, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed Apr. 16, 1971, Ser. No. 134,727
Int. Cl. H02m 7/00
U.S. Cl. 321—8 C **8 Claims**



Apparatus is provided for the rectification of a power source for the use ultimately in such applications as electroplating, with the apparatus utilizing electrical conducting materials in the form of tubing for conveying simultaneously cooling fluids directly to areas adjacent parts requiring cooling during operation, and electrical current over substantial portions of the circuitry of the apparatus. In addition, new heat sink arrangements are provided for more even distribution of cooling fluids over parts to be cooled, and new clamping arrangements are provided for even distribution of pressure on parts being held and which clamping arrangements are readily manipulated by a single adjustment.

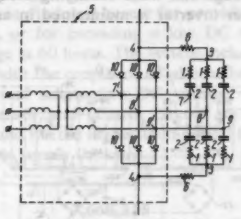
3,668,507

APPARATUS FOR DAMPING OSCILLATIONS IN THREE-PHASE BRIDGE CONVERTERS

Dmitry Evgenievich Kadomsky, prospekt Smirnova, 16, korpus 2, kv. 35, and Alexandr Sergeevich Nazarov, Ofitsersky pereulok, 7, kv. 7, both of Leningrad, U.S.S.R.

Filed June 4, 1971, Ser. No. 150,119
Int. Cl. H02m 1/18
U.S. Cl. 321—11 **2 Claims**

An apparatus for damping oscillations in three-phase bridge converters, made in the form of two three-branch stars, whose branches are damping sections composed of a capacitor and a resistor in series and are connected each to the respective phase of the bridge circuit, while the neutral points of the stars are connected each to one of the poles of



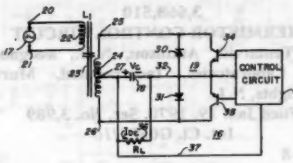
the bridge circuit, and there is a series resistor placed between at least one neutral point and the respective pole.

3,668,508

REGULATOR CIRCUIT

William A. Archer; Ronald H. Randall, both of Cuba, and Richard M. Lewis, Black Creek, all of N.Y., assignors to Acme Electric Corporation, Cuba, N.Y.

Filed Sept. 15, 1970, Ser. No. 72,401
Int. Cl. H02m 7/12
U.S. Cl. 321—18 **44 Claims**



A regulator circuit is disclosed incorporating a DC capacitor as an energy storage device to be charged to a direct voltage level from an AC source through switch means. The switch means may be semi-conductor switches and because of the direct voltage on the energy storage device, a substantially square wave alternating voltage appears on the switch input. An inductive reactance absorbs the instantaneous voltage differences between the square wave and the alternating voltage input. The switches are operated at the same frequency as the alternating voltage input and operate at a variable phase angle of lag of the leading edge relative to the alternating voltage input in order to regulate the voltage output which may either DC across the storage device or AC across the switch input. The switch means is a double throw switch conducting for substantially 180° alternately to obtain the direct voltage across the storage device. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,668,509

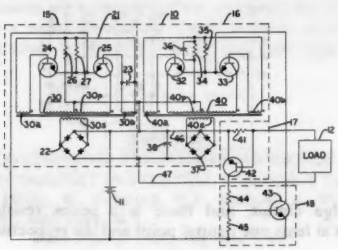
POWER SUPPLY SYSTEM FOR AND METHOD OF ENERGIZING MULTIPLE LEVEL LOADS

Richard E. Riebs, Hales Corners, and Curtis J. Kohlman, Milwaukee, both of Wis., assignors to McGraw-Edison Company, Milwaukee, Wis.

Filed Feb. 11, 1971, Ser. No. 114,543
Int. Cl. H02m 3/28
U.S. Cl. 321—18 **10 Claims**

A power supply for a direct current load that has two power level requirements senses the current requirements of the load and operates a high output inverter at high power

requirements and a low output inverter at low power requirements. The high and low output inverters are designed for maximum efficiency in their respective power ranges and are connected through full wave rectifying bridges to the load. The high power inverter is maintained in an "off" position



until the load current requirement is increased. Upon the increase in current, a sensing circuit and energy storage device activates a switch to energize the high power inverter to power the load as long as the current requirements remain above a selected level.

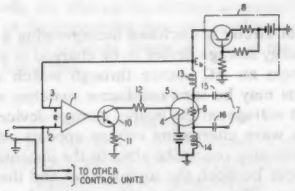
ERRATUM

For Class 322—28 see:
Patent No. 3,668,514

3,668,510
THERMISTOR CONTROL CIRCUIT

Kenneth D. Tentarelli, Atkinson, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Jan. 19, 1970, Ser. No. 3,989
Int. Cl. G05f 1/10
U.S. Cl. 323—8 **6 Claims**



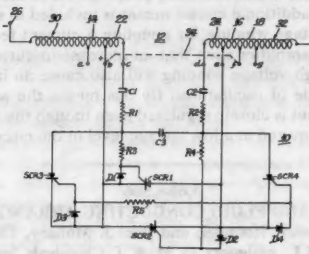
An indirectly heated thermistor control circuit wherein a constant current source is connected with the bead resistance of the thermistor to provide a reference voltage proportional to variations in bead resistance. The reference voltage is connected by a feedback path to the non-inverting input of a differential amplifier where it is combined with the input command voltage which is applied to the inverting input of the differential amplifier. The output signal from the differential amplifier provides the thermistor heater current and is proportional to the difference between the reference voltage and command voltage.

3,668,511
SELF ENERGIZING TAP SWITCH FOR ELECTRONIC TAP CHANGER

Charles E. Lewis, Zanesville, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 16, 1971, Ser. No. 115,204
Int. Cl. G05f 1/14
U.S. Cl. 323—43.5 S **14 Claims**

A self energizing tap switch is disclosed as being connected in circuit with the primary winding of a transformer having a plurality of tap sections connected to an electronic tap changer. The tap switch connects two portions of the primary winding together when the transformer is initially energized or after the winding has been energized when there is no shunt connection between connections or when a malfunction causes the opening of a tap connection between tap sections. The tap switch includes a pair of silicon controlled rectifiers for carrying transformer load current during alternate half cycles of the energy source connected to the terminals of the primary winding. The gating circuit for each of the silicon rectifiers includes a capacitor for creating a gate current which leads the load current in the situation where the load current leads the load voltage. When a tap section is shunted out of the primary winding by a tap connection, it is

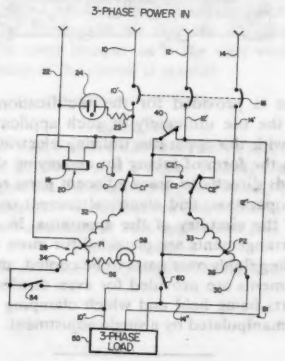


desired that the silicon controlled rectifiers do not conduct to short out the tap shunt connection and thereby effectively reinsert the tap section. To prevent such conduction, a second pair of silicon controlled rectifiers are each connected in parallel with the gate-cathode circuit of one of the first pair of silicon controlled rectifiers. The second pair of silicon rectifiers are gated when a tap shunt connection is made so that gate current to the first pair of silicon rectifiers is diverted and prevented from triggering the first pair of silicon controlled rectifiers.

3,668,512
AUTOMATIC VOLTAGE BOOSTER

James Carey, 306 Lee Avenue, Yonkers, N.Y., and Jay E. Citrin, 280 Ocean Parkway, Brooklyn, N.Y.

Filed May 12, 1971, Ser. No. 142,622
Int. Cl. G05f 5/00
U.S. Cl. 323—45 **5 Claims**



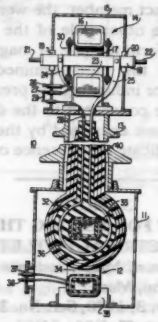
An instantly acting automatic voltage booster employing autotransformers each having a secondary winding connecting between power supply lines and a load in a three phase system for supplying power continuously to the load. Primary windings are maintained in short circuited condition by contacts of a relay actuated when voltage supplied via the supply lines remains above a predetermined minimum magnitude. The relay contacts open to energize the primary windings and induce voltage in the secondary windings when the supplied voltage falls to or below the predetermined magnitude for maintaining voltage supplied to the load above the predetermined magnitude. A switch is provided to short circuit the secondary windings and open circuit the primary windings in the event of equipment failure.

3,668,513

UPRIGHT TYPE BUSHING CURRENT TRANSFORMER

Denji Tsubouchi; Susumu Ito, both of Yokohama; Eisuke Toyota, Hiratsuka, and Kenji Wada, Yamato, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 19, 1971, Ser. No. 126,121
Claims priority, application Japan, Mar. 31, 1970, 45/26883
Int. Cl. H01f 40/06
U.S. Cl. 323—60 6 Claims



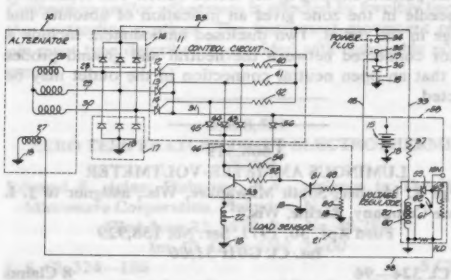
A bushing current transformer is provided and includes an auxiliary current transformer mounted on the top of a bushing. The primary and secondary coils of the auxiliary current transformer are connected parallel to each other and in series to an electrical power line having a high voltage and carrying a high current therethrough. A conductive lead is connected to the secondary coil of the auxiliary current transformer and is conducted to the bottom of the bushing to thereby form a primary coil of a main current transformer which is positioned on the bottom of the bushing and then conducted upwards again through the bushing. With such an arrangement the size of the line conductor being introduced into the bottom of the bushing can be made smaller, since the current transformation ratio between the primary and secondary coils of the auxiliary current transformer can be adjusted. Also, the current transformer can be standardized and thereby adapted for mass production due to the ability to fix the secondary current of the auxiliary current transformer at a constant amplitude.

3,668,514

DUAL VOLTAGE POWER SYSTEM FOR USE WITH VEHICLE ALTERNATORS AND THE LIKE

Donald W. Peck, Newbury Park, Calif., assignor to Oaks Power Corporation

Filed Sept. 15, 1970, Ser. No. 72,311
Int. Cl. H02p 11/00
U.S. Cl. 322—28 12 Claims



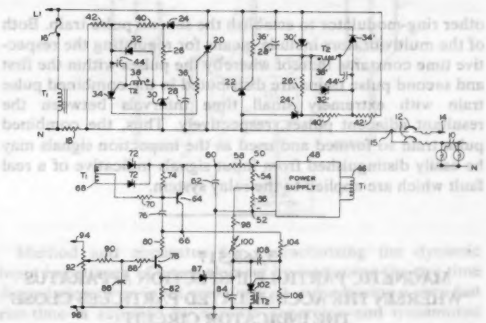
There is disclosed herein a dual voltage power unit for use in automobiles, campers, and the like for normally supplying the relatively low DC voltage from an alternator to a storage battery and other electrical devices of the vehicle and for supplying a higher voltage, such as 115 volts, for external usage such as for lighting, emergency power, and so forth. Several circuits are disclosed herein for providing a dual output DC voltage, or for providing a low DC voltage and a higher AC voltage at 60 hertz. The system includes a rectifier circuit coupled with the output of an alternator for normally providing the usual automotive DC voltage, such as 14.5 volts. A load sensor and control circuit are provided for sensing the demand for the higher voltage and for controlling rectifier circuits to supply the same.

3,668,515

LOAD CONTROL SYSTEM EMPLOYING SILICON CONTROLLED RECTIFIERS WITH OVERVOLTAGE PROTECTION AND COMPENSATION FOR LINE VOLTAGE FLUCTUATIONS

Arthur P. Horne, Portland, Oreg., assignor to Electronics Diversified, Inc., Portland, Oreg.

Filed Jan. 30, 1970, Ser. No. 7,093
Int. Cl. G05f 5/00
U.S. Cl. 323—22 SC 20 Claims



A control system for a load includes a pair of oppositely poled silicon controlled rectifiers disposed in parallel between a line and the load, each being provided with a drive circuit energized from across the rectifiers for triggering each silicon controlled rectifier at a predetermined time by discharging a capacitor via a control transistor. The triggering time is controllable. The triggering circuitry is empowered from the line whereby triggering also varies in a manner for maintaining a relatively constant output despite changes in line voltage. Each control transistor is additionally triggerable when the voltage across the pair of rectifiers reaches an excessive value, whereby the rectifiers are turned on alternately with each rectifier protecting the other.

3,668,516

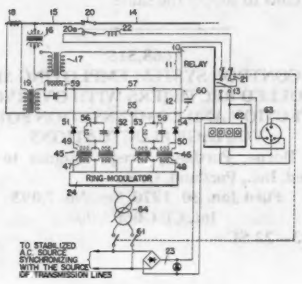
APPARATUS FOR INSPECTING A.C. ELECTRIC RELAY SYSTEMS DURING THE OPERATION THEREOF BY USE OF A HIGH FREQUENCY MODULATED SIGNAL

Masahide Muraoka, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 5, 1970, Ser. No. 9,009
Claims priority, application Japan, Feb. 10, 1969, 44/9485
Int. Cl. G01r 31/02
U.S. Cl. 324—28 R 7 Claims

In an apparatus for inspecting an A.C. responsive relay system during operation thereof a pulse train is provided having distinctly higher repeating frequencies than those input signals to the relay indicative of a real fault and which pulse train is modulated by A.C. voltages having frequencies and wave forms similar to those input signals for the relay indicative of a real fault. The pulse train so provided is created by

mixing a pair of first and second pulse trains modulated by A.C. voltages in a pair of ring-modulators. The pulse A.C. voltages used for the modulation have distinctly higher frequencies than those of the real fault input signals for the relay. The A.C. voltages for the modulation feed the positive half waves thereof to a first multivibrator associated with one of the ring-modulators to thereby provide the first train. The A.C. voltages for the modulation, further, feed its negative half waves to a second multivibrator associated with the



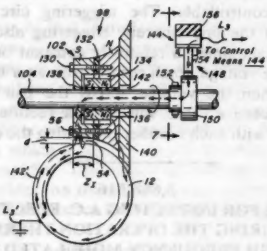
other ring-modulator to establish the second pulse train. Both of the multivibrators include means for regulating the respective time constants thereof whereby the pulses within the first and second pulse trains are distributed in the combined pulse train with extremely small time intervals between the resultant adjacent pulses, respectively. Thus, the combined pulse train so formed and used as the inspection signals may be easily distinguished from input signals indicative of a real fault which are applied to the relay system.

3,668,517

MAGNETIC PARTICLE INSPECTION APPARATUS WHEREIN THE ACCUMULATED PARTICLES CLOSE THE INDICATOR CIRCUIT

William L. Zemberry, Swissvale Borough, Pa., assignor to United States Steel Corporation

Filed July 30, 1970, Ser. No. 59,407
Int. Cl. G01r *33/12*
U.S. Cl. 324—38 **19 Claims**



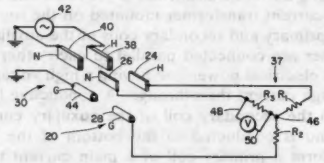
An automatic magnetic particle inspection apparatus for detecting a defect in the workpiece and for signalling the presence of the defect in the workpiece is disclosed. The apparatus has conveying means for supporting the workpiece, drive means connected to one of the conveying means and the apparatus for causing relative movement between the conveying means and the apparatus to convey the workpiece along a path of movement; magnetizing means disposed adjacent a path of movement of the workpiece and for creating lines of flux in the workpiece and fringe lines of flux adjacent the defect in an attraction zone; magnetic particles spray means disposed further along the path of movement of the workpiece for spraying magnetic particles on the magnetized workpiece to deposit the particles on the workpiece in a spray zone adjacent the attraction zone and to create a pile of the magnetic particles adjacent the defect in the attraction zone within the spray zone; and detecting and signalling means disposed further along the path of movement of the workpiece. The detecting and signalling means has a bi-pole detecting head which is spaced from the attraction zone a predetermined distance and has magnet means and a contact member for contacting the workpiece. The magnet means is operable to create lines of flux through one pole of the detecting head, the contact member, the workpiece, the pile of magnetic particles, the other pole of the detecting head to the magnet means to form the pile of magnetic particles and into a bridge across the predetermined distance. Signal means are employed for indicating the presence of the defect and control means are connected to the detecting head and the signal means and are energized by the bridge to actuate the signal means to indicate the presence of the defect.

3,668,518

INSTRUMENT FOR TESTING THREE-WIRE ELECTRICAL OUTLETS

Alan R. Shapiro, Sharon, Mass., assignor to Bio-Design, Incorporated, Stoughton, Mass.

Filed Apr. 3, 1970, Ser. No. 25,409
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **8 Claims**



The disclosure depicts apparatus for testing wiring connection patterns in a three-wire AC electrical outlet, comprising a three-wire plug adapted for insertion into an outlet and comprising a line probe, a neutral probe, and a ground probe. In the embodiments illustrated a test circuit connected to the plug includes circuit branches between each of the probes and a common terminal, the branches containing resistance means having different resistance values. An AC electrical meter is connected in one of the circuit branches such that deflection of the needle is proportional to the absolute current flow in that branch and also in the test circuit as a whole. Different wiring connection patterns in a tested outlet produce different series-parallel connections of the circuit branch resistances and thus establish different current flows in the branch including the meter. The meter has a scale upon which a plurality of discrete zones are marked with indicia characterizing the various outlet wiring connection patterns which are possible. Upon insertion of the plug into an outlet, the meter needle is deflected to a particular zone on the scale, thus identifying the particular wiring connection pattern existing in the tested outlet. The location of the needle in the zone gives an indication of absolute line voltage in the outlet. Two disclosed embodiment include a resistor connected between the neutral and ground probes such that an open neutral connection in the outlet may be detected.

3,668,519

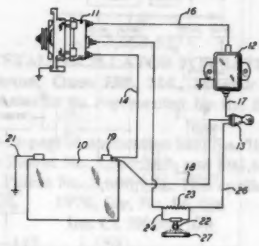
LUMINOUS AMMETER-VOLTMETER

George R. Mueller, South Milwaukee, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 30, 1971, Ser. No. 138,929
Int. Cl. G01r *31/00*
U.S. Cl. 324—96 **8 Claims**

A luminous ammeter-voltmeter of a type which is particularly useful in a vehicle which commonly has a relatively low voltage electric system. The system includes a battery, and a

type of electric generating means, and an electric regulator and a gauge for indicating amperage and voltage in the system. The gauge is in the form of a light bulb connected in the system to emit light rays in proportion to the electric power in the system, and the light rays are directed to a refractor which receives the light rays in various areas of the refractor. The refractor areas are respectively spaced from



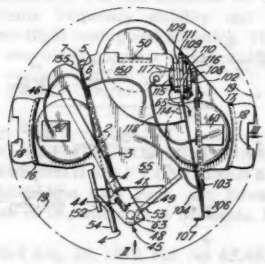
the light bulb to thereby indicate the intensity of the light emitted from the bulb, by having the refractor areas respectively located in the high-intensity light-ray position or the low-intensity position, that is, either close to or farther from the light bulb. The refractor is provided with indicia for visibly disclosing the quantity of electric power in the system by having the respective areas of the refractor illuminated in the different intensities mentioned.

3,668,520

MOVEMENT FOR INSTRUMENTS

Norman Blackham, Lane Farm, Sewell, England, and Mervyn H. H. Read, 15 Ronald Avenue, Greenwich, Australia

Filed Mar. 16, 1970, Ser. No. 19,820
Claims priority, application Great Britain, Mar. 14, 1969, 13,551/69
Int. Cl. G01r *5/26*; G05f *5/00*
U.S. Cl. 324—106 **4 Claims**



Bimetal instrument movements of the V-pivot type and the pin-pivot type in which the integral upstanding portions of a one-piece frame member support the fulcrum for the movements' pointer means and U-shaped bimetallic structure. Calibration and/or adjustment is effected by forcibly bending the upstanding portions. The instrument movement of the pin-pivot type described is provided with removable pointer means.

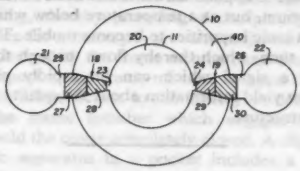
3,668,521

ZERO TEMPERATURE DRIFT ELECTROTHERMIC UNITS

Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Plainview, N.Y.

Filed June 22, 1970, Ser. No. 48,288
Int. Cl. G01r *5/22*, *21/00*
U.S. Cl. 324—106 **5 Claims**

An electrothermic unit comprising two thin film thermocouples mounted in a coaxial transmission line relative to location and the thermal resistive distributions thereof, such



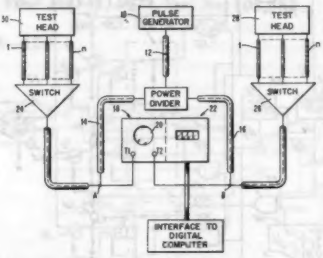
that the sum of the hot junction temperatures is substantially equal to the sum of the cold junction temperatures.

3,668,522

METHOD AND APPARATUS FOR CHARACTERIZING TEST ELEMENTS ON THE BASIS OF RISE-TIME DEGRADATION

Majid Ghafghaichi, Beacon, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1968, Ser. No. 782,299
Int. Cl. G01r *31/22*, *27/04*
U.S. Cl. 324—158 T **1 Claim**



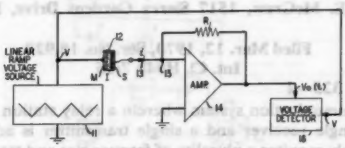
Method and apparatus for characterizing the dynamic input impedance of a test element by measuring the rise-time degradation of an input waveform. A pulse having a very fast rise-time is supplied by a pulse generator and transmitted down two branches of a balanced transmission line. One leg of the balanced transmission line is connected to a sensing means while the other leg of the balanced transmission line is connected to a test element as well as the sensing means. Thus, the sensing means would receive two identical pulses but for the rise-time degradation of the pulse connected to the test element. The test element is characterized on the basis of this rise-time degradation.

3,668,523

ELECTRICAL TESTING OF DIELECTRIC LAYERS, EXHIBITING VOLTAGE DEPENDENT CAPACITANCE, WITH LINEAR RAMP VOLTAGES

Matthew Kuhn, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 7, 1969, Ser. No. 822,675
Int. Cl. G01r *31/22*, *27/26*
U.S. Cl. 324—158 D **9 Claims**



In order to test a dielectric layered structure exhibiting a voltage dependent capacitance, a metal-insulator-semicon-

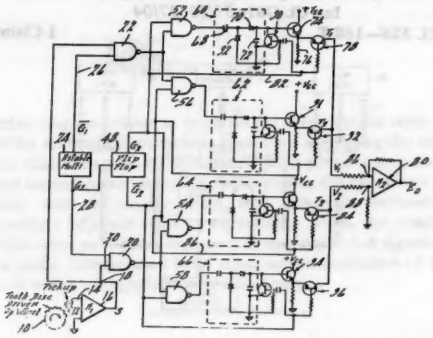
ductor (M-I-S) structure for example, a linear ramp (sawtooth) voltage is applied across the structure initially in thermal equilibrium, but at a temperature below which the insulator allows ionic impurities to become mobile. The profile of current vs. time, which thereby flows through the structure, constitutes a signal which can be rapidly electronically processed to yield information about the quality and properties of the structure.

3,668,524

ELECTRONIC CIRCUIT FOR DETECTING AND EVALUATING ANGULAR ACCELERATION AND DECELERATION OF A ROTARY MEMBER

James I. Berry, Livonia, and Zbigniew J. Jania, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 19, 1970, Ser. No. 3,667
Int. Cl. G01p 3/42
U.S. Cl. 324—162 **8 Claims**



An electronic circuit for developing a voltage signal that is proportional in magnitude to the acceleration or deceleration of a rotary member, including a speed pick-up signal generator connected to the rotary member and having an output signal in the form of voltage pulses, a plurality of voltage storage counters, each being connected to an output signal amplifier circuit, a separate electronic gate for controlling the entry of a triggering voltage signal to each of said storage counters and a multi-vibrator switching circuit connecting the input side of each gate with the output side of said speed pick-up whereby the signal generated by said speed pick-up is selectively distributed to the gates to allow each storage counter to develop an output signal voltage that is determined by the number of pulses generated by said pick-up within a predetermined interval, the differences in voltages stored by each counter thereby being a measure of the change in velocity of said rotary member during operation in one interval relative to the speed of the rotary member during operation in another interval.

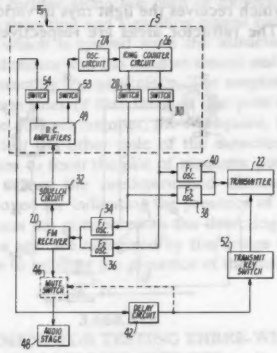
3,668,525

COMMUNICATION SYSTEM

Robert E. McGraw, 1517 Sierra Gardens Drive, Roseville, Calif.

Filed Mar. 12, 1970, Ser. No. 18,920
Int. Cl. H04b 7/16
U.S. Cl. 325—1 **5 Claims**

A communication system wherein a relay station comprising a single receiver and a single transmitter is adapted to selectively monitor a plurality of frequencies and transmit the monitored signal in one of a plurality of predetermined frequencies. To accomplish this end a sensing system is operated in conjunction with the receiver and transmitter to sense the incoming signal and lock the receiver and transmitter in an operating condition corresponding to the sensed incoming signal. Assuming that the receiver portion of the



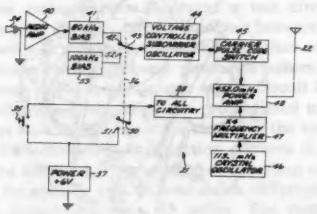
relay station is of an FM type, the squelch circuit thereof may be utilized in conjunction with the sensing device to lock the receiver on frequency.

3,668,526

COMMUNICATION SYSTEM HAVING MEANS FOR CAUSING A DISTRESS SIGNAL

Jerome S. Raskin, 20661 Suburbia Lane, Huntington Beach, Calif.

Filed Sept. 12, 1969, Ser. No. 857,496
Int. Cl. H04b 7/00
U.S. Cl. 325—64 **21 Claims**



A communication system including a short range hand held transmitter having the capability of transmitting an intelligence signal on one basic frequency and a steady signal on a second separate basic frequency to a vehicle located a short distance away, and a transceiver-input unit which is plugged into a standard transceiver in the vehicle, which unit is responsive to said one frequency signal to cause said transceiver to broadcast to a remote point the intelligence signal. Said unit is responsive to said second frequency signal to turn on the vehicle siren and lights, and also to change said constant signal into brief coded signals which are broadcasted by said transceiver at regular intervals with each brief coded

signal being no more than 33⅓ of the interval between two brief coded signals. Said units turns on the transceiver one-quarter second before the beginning of the brief coded signal and turns the transceiver off immediately upon conclusion of the brief coded signal. The transmitter broadcasts a carrier wave which is pulse coded around said one basic frequency by a subcarrier which is frequency modulated by the intelligence input into the transmitter.

3,668,527

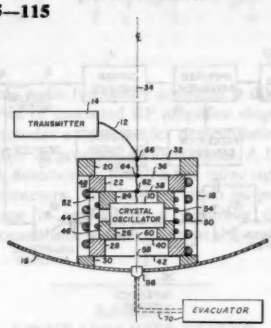
CRYSTAL OSCILLATOR FOR SATELLITE

Roger L. Easton, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 785,883, Dec. 23, 1968, now Patent No. 3,560,880, and 806,640, Mar. 12, 1969, now Patent No. 3,600,951. This application Nov. 3, 1970, Ser. No. 86,496

Int. Cl. H04b *1/04*

U.S. Cl. 325—115 **4 Claims**



Structure and apparatus located on a satellite which control the environment of a crystal oscillator for the purpose of attaining extreme frequency stability and reducing the problems of pre-flight testing and adjusting. The oscillator is located in an evacuated chamber together with heat shields and ovens.

3,668,528

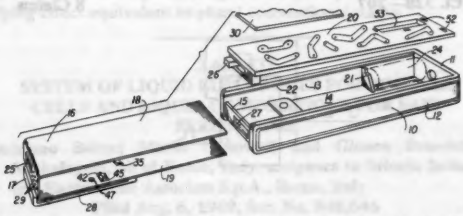
HOUSING ASSEMBLY FOR MINIATURE RADIO APPARATUS WITH SELF CONTAINED BATTERY

Thomas R. Hutchinson, Oak Park, and Edward J. Caper, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 20, 1970, Ser. No. 65,453

Int. Cl. H04b *1/08*

U.S. Cl. 325—352 **16 Claims**



Housing assembly for miniature radio apparatus, such as a radio pager, having a molded frame member which supports the chassis and forms one end and two opposite sides of a housing. A U-shaped cover member slides in grooves in the frame member to form the other end and the other two sides of the housing, thereby providing a completely enclosed housing. Space for a battery is provided adjacent the end of the housing formed by the frame member, and the cover can slide with respect to the frame member to open the housing at that end to afford access to the battery. A detent is provided on the frame member which engages the cover member to hold the cover completely closed. A clip for holding the radio apparatus in a pocket includes a button to release the detent to permit the cover to slide for access to the battery. A second detent prevents further movement of the cover with respect to the housing preventing access to the radio chassis, with a key being required to release the second detent for removal of the cover from the frame member. Both single use and rechargeable batteries can be used, and contacts are provided in the housing for connecting the rechargeable battery to a charger.

3,668,529

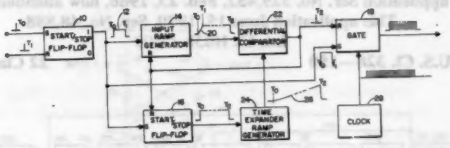
MEASURING CLOSELY SPACED PULSES USING TIME EXPANSION

Jack R. Meyer, Columbia Heights, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 11, 1971, Ser. No. 105,582

Int. Cl. H03k *17/28*

U.S. Cl. 328—129 **4 Claims**



Apparatus for measuring the time between first and second pulses where the time is expanded by comparing the voltage held in a first fast ramp generator with that being developed by a second slow ramp generator. The expanded time is directly proportional to the actual time between pulses and is used to gate a clock, providing a digital signal proportional to the actual time.

3,668,530

APPARATUS FOR ELECTRONICALLY EVALUATING SIGNALS IN MUTUAL PHASE-QUADRATURE

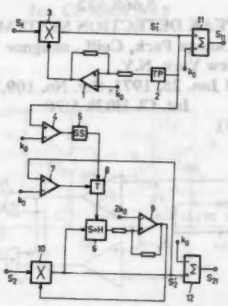
Francois Mottier, Zurich, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 13, 1971, Ser. No. 143,028

Claims priority, application Switzerland, May 26, 1970, 7782/70

Int. Cl. G06g *7/14*; **H03k** *5/20*

U.S. Cl. 328—147 **6 Claims**



Apparatus for electronically evaluating two output signals in mutual phase-quadrature from a measuring device in

which the two phase-displaced signals are fed by way of parallel channels to the evaluating circuits and are represented respectively as the sine and cosine functions of which the argument is a measured variable proportional to the measured quantity. In order to establish an essentially error-free evaluation of the two signals so as to avoid errors which might be introduced as a result of variations of certain constants and differences in waveform of the signals, a regulator circuit provides for regulation of the d.c. component of one of the signals to a predeterminable voltage level, a comparator circuit continuously compares the instantaneous values of the regulated signal with that voltage level, a sensing and holding circuit is actuated at the moment when the instantaneous value of the first signal and the predeterminable voltage reach equality, the second signal is applied as an input to the sensing and holding circuit, the voltage value stored in the sensing and holding circuit is continuously compared with twice the value of the predeterminable voltage level, and an error signal proportional to any difference which may exist between these latter two compared values is utilized to regulate the second signal to this value.

3,668,531

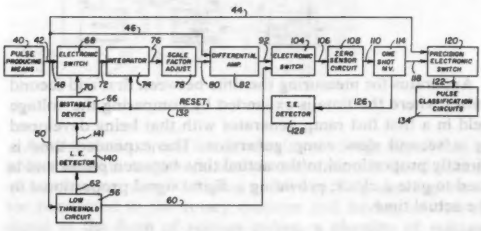
PULSE ANALYZING APPARATUS

Walter R. Hogg, Hialeah, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of application Ser. No. 614,496, Feb. 7, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 529,452, Feb. 23, 1966, now abandoned. This application June 15, 1970, Ser. No. 48,888

Int. Cl. H03k *17/00*

U.S. Cl. 328—150 **22 Claims**



Apparatus finding the amplitude of a pulse at its center by comparing the pulse with its integral, adjusted to pass through the amplitude of the pulse at its time center, and passing to coincident gating means a signal having the pulse center amplitude at that time and a signal of fixed duration initiated at the finding of the pulse center. Also, a particle analyzing a system intercoupling the amplitude finding apparatus between a pulse generating transducer of liquid suspended particles and pulse classification structure.

3,668,532

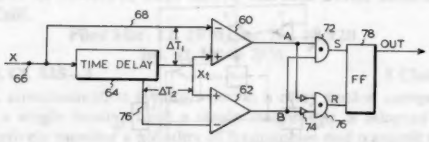
PEAK DETECTION SYSTEM

Hanan Potash, Canoga Park, Calif., assignor to Sperry Rand Corporaton, New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,207

Int. Cl. H03k *5/20*

U.S. Cl. 328—151 **7 Claims**



A system for detecting the peaks in an analog signal whose amplitude varies with respect to time. The system employs a delta differentiation technique to develop two separate binary differential signals; i.e., a first highly accurate short time constant differential signal and a second relatively noise immune long time constant differential signal. The two differential signals are then logically combined to yield a relatively noise immune output signal which accurately indicates the peaks in the analog signal.

3,668,533

FEEDBACK CONTROL SYSTEMS

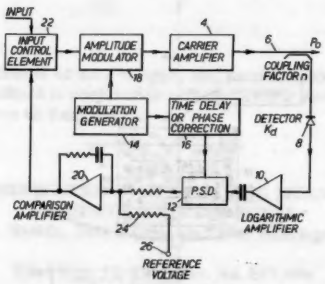
Percy J. Fish, Bassett, and Malcolm B. Clark, Winchester, both of England, assignors to Tlessey Handel und Investments A.G., Zug, Switzerland

Filed Jan. 11, 1971, Ser. No. 105,573

Claims priority, application Great Britain, Jan. 10, 1970, 1,307/70

Int. Cl. H04b *3/10*

U.S. Cl. 328—168 **7 Claims**



An amplifier arrangement includes an amplifier and a feed back system for maintaining the amplifier operating at a direct point on a non-linear part of its characteristic. The feed back system includes a generator for adding a pilot signal to the main input signal to the amplifier and a detector for detecting the amplified pilot signal. The amplitude of the amplified pilot signal will depend upon the operating point of the amplifier in its characteristic. By comparing the amplified pilot signal with a reference signal representative of a desired point in the amplifier characteristic, the amplitude of the main input signal is varied to maintain the amplifier operating at the desired point.

3,668,534

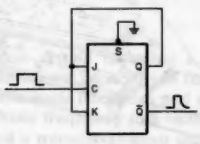
J-K FLIP-FLOP MONOSTABLE MULTIVIBRATOR APPARATUS

James R. Perry, Jr., Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Mar. 5, 1971, Ser. No. 121,426

Int. Cl. H03k *3/10*

U.S. Cl. 328—207 **8 Claims**

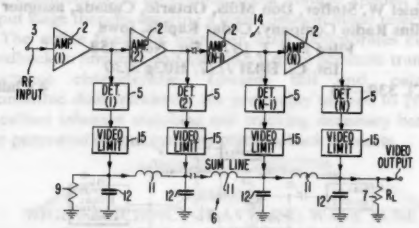


The circuit and method of connecting a J-K flip-flop so that it will operate as a one-shot multivibrator comprising establishing a "set" input at a logic 0 and an appropriate J or K input at a logic 1 for momentary operation in response to a clock input.

3,668,535
LOGARITHMIC RF AMPLIFIER EMPLOYING SUCCESSIVE DETECTION

Kenneth H. Lansdowne, Deer Park, N.Y., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 15, 1970, Ser. No. 3,164
Int. Cl. H03d 1/10
U.S. Cl. 329—192 4 Claims

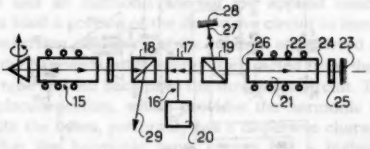


A logarithmic radio frequency amplifier is disclosed which employs a series of cascaded RF amplifier stages. Each amplifier stage includes a detector for demodulating the output of each amplifier to produce a video signal. A limiter is provided for each detector for limiting the video signal output of each of the detectors. The limited video output from each successive stage is applied to a summing delay line to produce the logarithmic video output at the end of the delay line.

3,668,536
LIGHT AMPLIFIER STAGES

Maurice Michon, Draveil, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Apr. 24, 1970, Ser. No. 31,634
Claims priority, application France, Apr. 24, 1969, 6913114
Int. Cl. H01s 3/05
U.S. Cl. 330—4.3 2 Claims



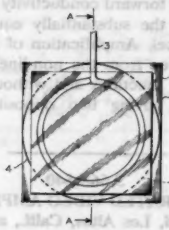
The present invention concerns light amplifier stages in which the provision of a fully reflecting surface at the end of a conventional amplifier stage causes it to produce an amplifying effect equivalent to plural conventional stages.

3,668,537
SYSTEM OF LIQUID ELECTRODES FOR POCKELS CELLS AND LIQUID COMPOSITIONS FOR SAID ELECTRODES

Adriano Berne; Mario Cesarotti, and Glauco Benedetti Michalagelli, all of Rome, Italy, assignors to Selenia Industrie Elettroniche Associats S.p.A., Rome, Italy

Filed Aug. 6, 1969, Ser. No. 848,046
Claims priority, application Italy, Aug. 31, 1968, 39447 A/68
Int. Cl. H01s 3/10
U.S. Cl. 330—4.3 6 Claims

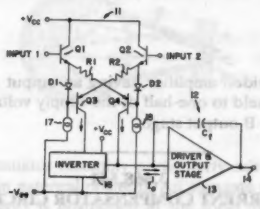
A Pockels cell with liquid electrodes, in which said electrodes comprise a water solution formed by the salt of the electro-optical crystal and by another simple salt having an ion common with that of the salt of the electro-optical crystal.



3,668,538
FAST SLEWING OPERATIONAL AMPLIFIER

William E. Hearn, Atherton, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 19, 1970, Ser. No. 12,709
Int. Cl. H03f 1/02
U.S. Cl. 330—9 5 Claims

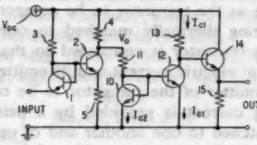


A fast slewing operational amplifier having as an output stage an inverting integrator and as an input stage a differential amplifier. The output current of the differential amplifier varies in accordance with the differential input voltage to cause the integrator stage to slew in an exponential manner. The differential amplifier includes two pairs of complementary transistors with their emitters cross-coupled.

3,668,539
LOW LEVEL AMPLIFIER

Robert Joseph Healey, Morris Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 29, 1970, Ser. No. 59,251
Int. Cl. H03f 3/18
U.S. Cl. 330—17 6 Claims



A low level d.c. error detector circuit wherein a semiconductor asymmetrically conducting device, such as a transistor connected as a diode, is serially connected with the low im-

pedance signal source to be detected and the base-emitter path of the detecting transistor. The transistor-diode and the detecting transistor have the same semiconductor ratings and are poled with their forward conductivity paths connected in opposition so that the substantially equal voltages across their junctions cancel. Amplification of low level signals is thereby provided free from the non-linear effects and sensitivity of transistor junctions and without the use of a differential amplifier having two opposite polarity biasing sources.

3,668,540

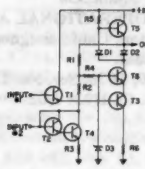
INTEGRATED VIDEO AMPLIFIER

Hans R. Camenzind, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of application Ser. No. 791,661, Jan. 6, 1969, now abandoned. This application July 13, 1970, Ser. No. 56,205

Int. Cl. H03f 3/42

U.S. Cl. 330—18 **3 Claims**



Integrated video amplifier having an output voltage which is accurately held to one-half of the supply voltage and which utilizes a class B output stage.

3,668,541

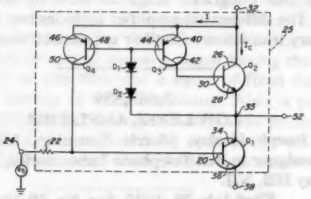
CURRENT COMPENSATOR CIRCUIT

Robert A. Pease, Wilmington, Mass., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Mar. 23, 1970, Ser. No. 21,736

Int. Cl. H03f 1/32

U.S. Cl. 330—23 **9 Claims**



A current compensating circuit for compensating a transistor for thermal variations in its operating point. The circuit includes a compensating transistor of the same conductivity type as the transistor to be compensated, the two transistors being thermally matched to one another. The compensating transistor is connected so that it is supplied with a constant electric current and its emitter is direct coupled to the emitter of the transistor to be compensated. A compensating current is provided by a pair of transistors thermally matched to one another and of opposite conductivity type to the first transistors. One of the second pair has its collector connected to the base of the compensating transistor while the other of the second pair has its collector connected to the base of the transistor to be compensated. The current generating transistors have their bases connected to one another and their emitters connected to one another and to the collector of the compensating transistor. The principles are also applicable to a more complex circuit such as a differential amplifier wherein each of the input transistors of the differential amplifier are provided with transistors which provide a thermally variable correction current to the respective bases of the input transistors.

3,668,542

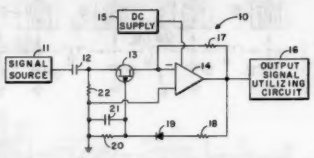
AUDIO COMPRESSION CIRCUIT

C. Daniel W. Stoffer, Don Mills, Ontario, Canada, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Feb. 3, 1970, Ser. No. 8,258

Int. Cl. H03f 1/32; H03g 3/30

U.S. Cl. 330—23 **4 Claims**



An audio compressor using a P-channel junction field effect transistor (JFET) as a voltage controlled resistor at the input of an integrated circuit operational amplifier. Good frequency response and fast attack are provided since the gain control element is not a part of the biasing circuit with limitations due to settling time thereby avoided.

3,668,543

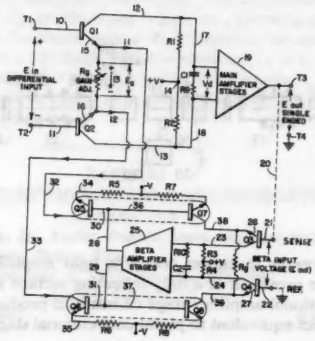
TRANSDUCER AMPLIFIER SYSTEM

Dean C. Bailey, Los Altos, Calif., assignor to Intech Incorporated, Santa Clara, Calif.

Filed Jan. 31, 1968, Ser. No. 702,025

Int. Cl. H03f 3/68

U.S. Cl. 330—30 D **11 Claims**



A solid state transducer amplifier system is provided in the form of a main operational amplifier having a differential input stage and an active series connected feedback loop as opposed to the conventional passive types of feedback. The active feedback loop incorporates a differential amplifier having an extremely accurate and linear differential transconductance characteristic such that the output voltage signal from the main operational amplifier fed to the differential feedback amplifier results in the generation of a differential feedback current proportional to this voltage. This differential feedback current generates a feedback voltage

which is balanced against the differential input signal in the input stage so that changes in the differential input signal are followed by changes in the feedback voltage. Since the value of the differential feedback current is at all times determined by the output voltage signal from the main amplifier fed into the feedback loop, the output voltage signal constitutes a very accurate and linear amplification of the differential input signal.

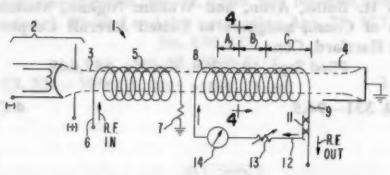
The differential feedback current is virtually unchanged by the common mode differential input voltage applied to the input stage thereby assuring a high common mode rejection.

The active feedback amplifier itself incorporates current feedback to linearize and establish a more accurate transconductance characteristic. Towards this end, pairs of monolithic dual transistors are preferably utilized to provide excellent inherent matching and tracking necessary between the generated output currents and feedback currents.

3,668,544
HIGH EFFICIENCY TRAVELING WAVE TUBE EMPLOYING HARMONIC BUNCHING

Erling L. Lien, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Sept. 3, 1970, Ser. No. 69,295
Int. Cl. H01j *25/34*
U.S. Cl. 330—43 **9 Claims**



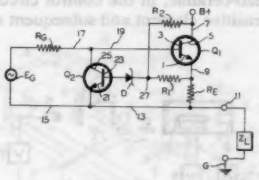
A slow wave tube is disclosed wherein the signal to be amplified and an harmonic thereof are applied concurrently over at least a portion of the slow wave circuit to increase the RF conversion efficiency of the tube. In a preferred embodiment, the harmonic wave energy is extracted from the output of the tube and fed back onto the slow wave circuit. The slow wave circuit portion, which provides the harmonic interaction with the beam, preferably has a dispersive characteristic such that the harmonic wave energy has a higher phase velocity than the fundamental wave energy for enhanced RF conversion efficiency.

3,668,545
APPARATUS FOR AMPLIFIER PROTECTION

Daniel R. Von Recklinghausen, Arlington, Mass., assignor to H. H. Scott, Inc., Maynard, Mass.

Continuation of application Ser. No. 649,661, June 28, 1967, now abandoned. This application Nov. 3, 1969, Ser. No. 871,603
Int. Cl. H03f *21/00*
U.S. Cl. 330—207 P **17 Claims**

Protection for amplifiers and the like is provided by proportionally combining a measure of the voltage across the output terminals with a measure of the output current and actuating switching means across the input terminals when a proportional combination exceeds a predetermined value. Transistors may be employed as the amplifier and switching means, and push-pull amplifiers may be so protected. In one embodiment a current-responsive protection device protects both transistors of a push-pull circuit. Multiple proportioning ranges may be provided in a non-linear protection arrangement, and the protection device may be rendered insensitive

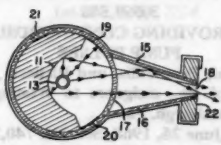


to short duration overloads. Reverse current protection may also be provided by the addition of one or more diodes.

3,668,546
LASER STIMULATOR ASSEMBLY

Edward R. Schumacher, 4728 54th Street, San Diego, Calif.

Filed Jan. 11, 1971, Ser. No. 105,447
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **5 Claims**



A laser stimulator assembly particularly suited for exciting a laser from an external position. An elongate source of laser excitation energy is positioned at the focal axis of an ellipsoidal reflector and together with cylindrical retro-reflectors and two extending plane reflectors directs the maximum amount of laser excitation energy to an elongate aperture with the minimum loss by reason of multiple reflections. The ellipsoidal reflector and the retroreflectors are positioned within a fluid-tight enclosure comprising a body member and two end members. Communication to the inside of the fluid-tight enclosure is provided through its end members for connection of the source of laser excitation energy to an external source of actuating energy. The same communication means in the form of an electrical conductor may, in the preferred embodiment, be hollow, providing a fluid path through the end members for circulating a cooling medium through the interior of the assembly and in contact with the elongate source of laser excitation energy to increase its efficiency. The cooling medium is preferably a selected fluid having desirable light transmissive and heat conduction properties, as well as being electrically non-conductive.

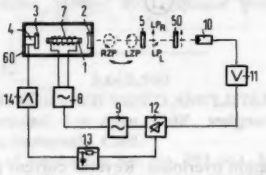
3,668,547
FREQUENCY-STABILIZED LASER ARRANGEMENT

Viktor Bodlaj, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 10, 1971, Ser. No. 122,796
Claims priority, application Germany, Apr. 1, 1970, P 20 15 612.1
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **7 Claims**

A laser arrangement for the stabilization of the frequency of a one or two mode gas laser, particularly a short He–Ne laser, where the stimulated medium is arranged between a fixed mirror and a mirror which is displaceable by means of a piezo-ceramic in the axial direction of the laser, the laser beams discharging from the partially transparent fixed mirror

being used to generate a DC voltage control signal which is proportional to the frequency deviation of the laser beams with respect to the central frequency of the amplifying transfer, returning the resonator to the central frequency by way of the piezo-ceramic, in the control circuit which contains a photosensitive element and subsequent amplifiers and



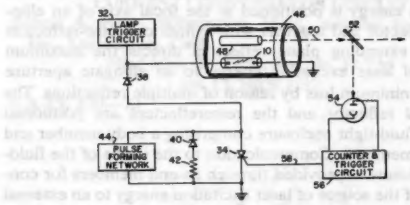
phase sensitive demodulators. The stimulated medium is arranged, at least partially, in a magnetic coil which is excited to generate an axis-parallel alternating magnetic field. A λ4 plate and a polarization device are arranged between the fixed partially transparent mirror and the photo-sensitive element.

3,668,548

SYSTEM FOR PROVIDING CONTINUOUSLY VARIABLE PUMP PULSES

Thaddeus A. Osial, Penn Hills, and Richard J. Ravas, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 26, 1968, Ser. No. 740,220
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **4 Claims**



Described is an electric flash producing system wherein the period of the flash can be continuously and accurately varied. These flashes are used, for example, as a pumping light source for laser crystals. Also described is a system for producing single giant spikes or a controlled number of giant spikes by the use of laser rods formed from uranyl-sensitized neodymium glass.

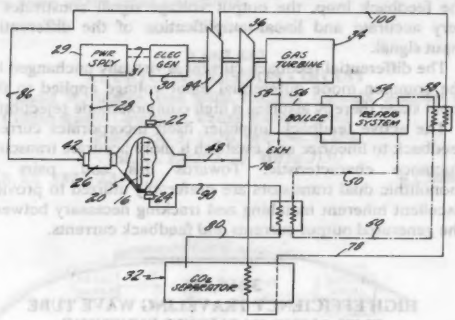
3,668,549

EXTENDED CLOSED CYCLE GAS LASER SYSTEM

Frank R. Biancardi, Vernon, Conn., and Gorken Melikian, Springfield, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 10, 1969, Ser. No. 857,646
Int. Cl. H01s *3/04*
U.S. Cl. 331—94.5 **21 Claims**

A flowing gas laser system is connected to a closed cycle, so that the gas effluent is reused, the gases being refrigerated to a temperature between 100° F and minus 40° F, or lower utilizing either heat exchange with a refrigeration cycle or gas expansion means, with or without additional pre-cooling utilizing ambient heat exchangers. Embodiments include premixed laser systems, and mixing type systems wherein the



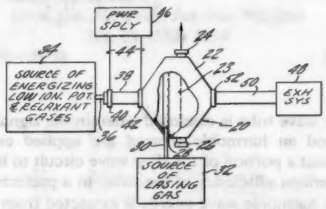
lasing gas is separated from other gases, in which case cooling to a point below ambient takes place after the separation.

3,668,550

GAS LASER LOW IONIZATION ELECTRIC DISCHARGE

Robert H. Bullis, Avon, and William Nighan, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 10, 1969, Ser. No. 857,648
Int. Cl. H01s *3/09*, *3/22*
U.S. Cl. 331—94.5 **4 Claims**



An electric discharge gas laser includes in its gas mixture a small amount of low ionization potential substance proportioned so as to provide a ratio of electric field intensity to neutral gas density within an electric discharge plasma which promotes substantially maximum upper laser level excitation in the lasing gas. Specific embodiments include CO_2—N_2H-e—Cs and CO_2—Cs—He, in mixing and pre-mixed configurations.

3,668,551

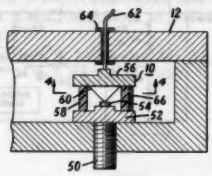
SOLID STATE MICROWAVE OSCILLATOR WITH CERAMIC CAPACITANCE TEMPERATURE COMPENSATING ELEMENT

Akihiro Kondo, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1970, Ser. No. 86,141
Claims priority, application Japan, Nov. 4, 1969, 44/88307; Sept. 10, 1970, 45/79486
Int. Cl. H03b *3/04*, *7/14*
U.S. Cl. 331—96 **13 Claims**

An enclosed Gunn effect diode is disposed within a microwave resonant cavity. A capacitive element of dielec-

tric ceramic such as titanium oxide having a negative temperature coefficient of capacitance is attached to the insulating portion of the enclosure for the diode. Alternatively the enclosure for the diode may be partly or entirely formed of such a dielectric ceramic.



3,668,552

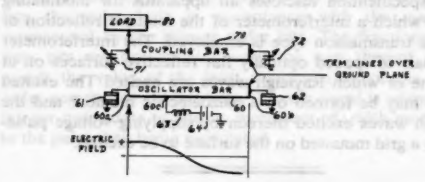
PUSH-PULL TRANSFERRED ELECTRON OSCILLATOR

Hiromu J. Kuno, Palos Verdes Peninsula, Calif.; Bertrand E. Berson, Trenton, and James F. Reynolds, Cranbury, both of N.J., assignors to The United States of America as represented by the Secretary of the Air Force

Original application Dec. 18, 1969, Ser. No. 886,238, now abandoned. Divided and this application Apr. 29, 1971, Ser. No. 138,423

Int. Cl. H03b 7/14

U.S. Cl. 331—100 2 Claims



A push-pull transferred-electron oscillator circuit in which a number of transferred-electron devices are connected in parallel to a DC bias circuit, but, in the RF (radio frequency) circuit, they operate in a push-pull manner so that the RF power is increased by four times for the same RF impedance.

3,668,553

DIGITALLY TUNED STRIPLINE OSCILLATOR

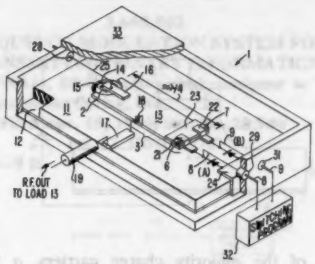
Vernon E. Dunn, Mountain View, and Arthur B. Vane, Menlo Park, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed June 26, 1970, Ser. No. 50,266

Int. Cl. H03b 7/06

U.S. Cl. 331—107 G 8 Claims

A digitally tuned microwave microstrip oscillator is disclosed. The oscillator includes a resonant section of stripline having a Gunn diode connected between the stripline and ground plane at a low impedance point and having one or more tuning capacitors connected via p-i-n diodes between a high voltage portion of the stripline resonator and the ground plane. Means are provided for selectively biasing one or more of the p-i-n diodes to a conductive state for switching one or more of the tuning capacitors across the resonant stripline for digitally tuning the resonator and oscillator in discrete frequency steps according to the switched condition of the diodes.



3,668,554

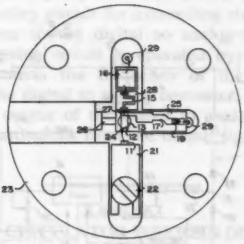
YIG-TUNED SOLID STATE MICROWAVE OSCILLATOR

John J. Dupre, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 29, 1971, Ser. No. 128,924

Int. Cl. H03b 7/14

U.S. Cl. 331—107 R 12 Claims



A tunable solid state microwave oscillator comprising a solid state device having negative resistance characteristics connected in series with the tuning circuit of a YIG resonator, the tuning circuit in turn being connected in series with the output of the oscillator. An impedance transforming network is connected in series between the YIG-tuning circuit and the output. A selective attenuator network may be coupled between the impedance transformer network and the output.

3,668,555

SEMICONDUCTOR DEVICE FOR PRODUCING OR AMPLIFYING ELECTRIC OSCILLATIONS AND CIRCUIT ARRANGEMENT COMPRISING SUCH A DEVICE

Wolfdietrich Georg Kasperkovitz, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,782

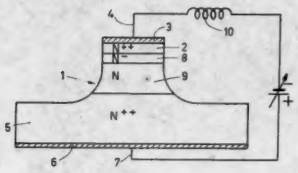
Claims priority, application Netherlands, Jan. 17, 1969, 6900787

Int. Cl. H03b 7/14

U.S. Cl. 331—107 R 10 Claims

An electronically tunable semiconductor device for producing and amplifying electric oscillations, comprising between two ohmic contacts at least one thin layer of a low conductivity and a thicker layer of a higher conductivity,

with a difference in doping concentration which is smaller than $5 \cdot 10^{10}(\epsilon_0\epsilon_r/q)$ (E_{av}/v), where E_{av} is the field strength with beginning avalanche multiplication, v the saturation



velocity of the majority charge carriers, q the electron charge, and ϵ_r the dielectric constant of the semiconductor material.

3,668,556

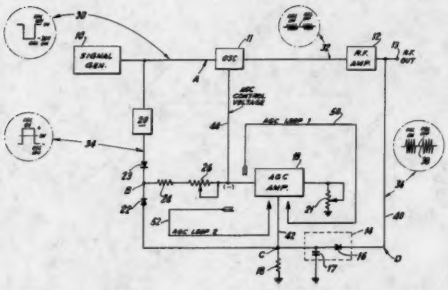
AUTOMATIC GAIN CONTROL CIRCUIT

William D. Harbeson, Montville, N.J., assignor to Ohmega Laboratories, Pine Brook, N.J.

Continuation of application Ser. No. 810,450, Mar. 26, 1969, now abandoned. This application May 11, 1971, Ser. No. 142,369

Int. Cl. H03b *3/02*

U.S. Cl. 331—109 **5 Claims**



An automatic gain control circuit for pulsed oscillators or other gate circuits which are intermittently operated. The control voltage for the amplitude of oscillator output is regulated to a substantially constant value even during the non-operating or blanking portion of the oscillator operation by a resistance-diode network responding to a blanking or switching signal in phase with the blanking or gating signals controlling the operation of the oscillator.

3,668,557

LOW FREQUENCY BLOCKING OSCILLATOR

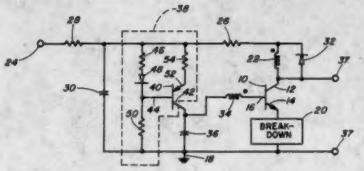
Charles H. Johnson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 4, 1970, Ser. No. 69,682

Int. Cl. H03k *3/30*

U.S. Cl. 331—112 **4 Claims**

A low frequency astable blocking oscillator composed of a transistor with a first transformer winding in the collector circuit and a second transformer winding in the base circuit to provide regenerative feedback between the collector and the base. A capacitor is connected to the transistor and is charged by a constant current source to initiate operation of the blocking oscillator when a predetermined voltage is reached. A voltage breakdown device is coupled to the transistor to raise the voltage required by the capacitor before blocking oscillator action commences thereby providing low frequency operation.



3,668,558

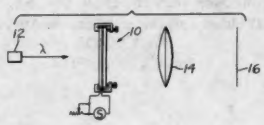
SURFACE WAVE INTERFERENCE MODULATOR

Billy Jo Hunsinger, Urbana, Ill., assignor to The Magnovox Company, Fort Wayne, Ind.

Filed Dec. 11, 1969, Ser. No. 884,097

Int. Cl. H01s *3/00*

U.S. Cl. 332—7.51 **7 Claims**



The specification discloses an apparatus for modulating light in which a interferometer of the multiple reflection or multiple transmission type is employed. The interferometer has a pair of spaced optically flat reflective surfaces on at least one of which Rayleigh waves are excited The excited surface may be formed on a piezoelectric member and the Rayleigh waves excited thereon by supplying voltage pulsations to a grid mounted on the surface to be excited.

3,668,559

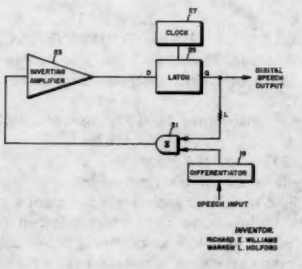
AUDIO TO DIGITAL CONVERTER

Richard E. Williams, Reston, and Warren L. Holford, Fairfax, both of Va., assignors to Scope Incorporated, Reston, Va.

Filed Nov. 16, 1970, Ser. No. 89,781

Int. Cl. H03k *13/22*

U.S. Cl. 332—9 R **2 Claims**



An audio-to-digital converter having a comparator means for comparing an audio input with a feedback signal. The

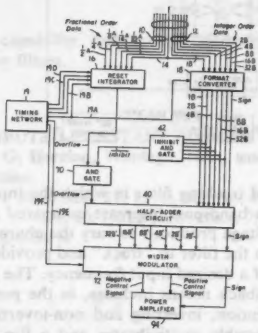
feedback is coupled to the comparator through a feedback control device so that a constant comparison occurs.

3,668,560

PULSE-WIDTH FREQUENCY MODULATION DEVICE

Joseph J. Padalino, West Orange, N.J., and Alfons A. Tuszynski, San Diego, Calif., assignors to Research Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,435
Int. Cl. H03k 7/08
U.S. Cl. 332—9 6 Claims



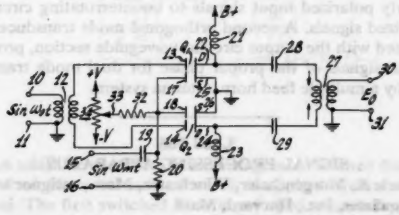
As described herein, a train of pulses used to control a servo-motor is modulated in accordance with the values of a varying digital input signal. To obtain accuracy of control, the digital input signal is divided into two components; a first group of bits representing integer order values; and a second group of bits representing fractional order data. A modulating circuit responds to the integer order bits to width modulate the pulse train in accordance with the magnitude represented by the integer order bits. The fractional order data bits are accumulated until the sum thereof at least equals the value of the least significant bit of the integer order component. At this time, the sum signal is added to the integer order data to add an increment of width modulation to the pulse then being modulated.

3,668,561

FIELD EFFECT TRANSISTOR MODULATOR CIRCUIT

John Eugene Krupa, and Mario Robert Paglee, both of Moorestown, N.J., assignors to RCA Corporation

Filed June 29, 1970, Ser. No. 50,625
Int. Cl. H03c 1/36
U.S. Cl. 332—31 T 4 Claims



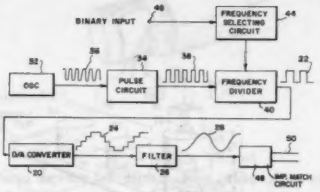
A modulator circuit employing two dual gate field effect transistors. A carrier signal is applied to one gate of each transistor in a push-pull arrangement. A modulating signal is applied to the other gate of each transistor in parallel. The modulated output signal appears between the drains of the transistors.

3,668,562

FREQUENCY MODULATION SYSTEM FOR TRANSMITTING BINARY INFORMATION

George A. Fritkin, Silver Spring, Md., assignor to Tel-Tech Corporation, Silver Spring, Md.

Filed Apr. 15, 1970, Ser. No. 28,740
Int. Cl. H04l 27/12
U.S. Cl. 332—9 R 13 Claims



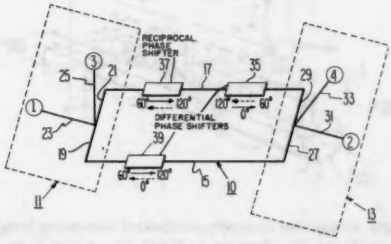
A system for transmitting binary information in the form of a frequency modulated signal is provided. The system includes a digital to analog converter for converting a series of input pulses into an output signal consisting of a series of incremental voltage changes which is approximately in the form of a sine wave having a frequency determined by the frequency of the input pulses. The system also includes a frequency selecting circuit for controlling the frequency of the input pulses to the digital to analog converter. The frequency selecting circuit is operated by a binary input signal and controls the frequency of the output signal produced by the digital to analog converter. A filter is connected to the output of the digital to analog converter to eliminate discontinuities from the output signal of the converter.

3,668,563

BROADBAND CIRCULATOR WHEREIN DIFFERENTIAL PHASE SHIFT VARIES WITH FREQUENCY IN PREDETERMINED MANNER

Wieslaw Wojciech Siekanowicz, Trenton, N.J., assignor to RCA Corporation

Filed Dec. 21, 1970, Ser. No. 99,912
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 8 Claims



A circulator includes a pair of magic tees and a pair of coupling paths therebetween. Each of the coupling paths includes a differential phase shifter. The differential phase shifter in a first path is arranged to provide a differential phase shift that increases with increase in frequency. The second differential phase shifter in the second path is arranged to provide a differential phase shift that decreases

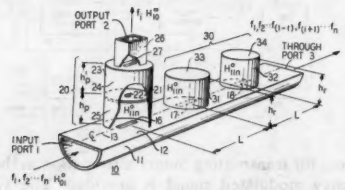
with increase in frequency. A reciprocal phase shifter is in the first path in series with the first differential phase shifter.

3,668,564

WAVEGUIDE CHANNEL DIPLEXER AND MODE TRANSDUCER

Chung-Li Ren, Andover, Mass., and Han-Chiu Wang, Salem, N.H., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1971, Ser. No. 134,805
Int. Cl. H01p *1/16, 5/12*
U.S. Cl. 333—6 **14 Claims**



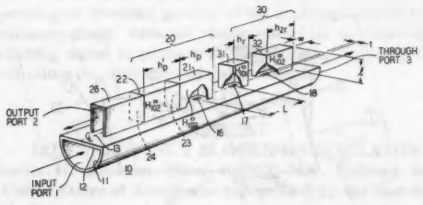
A waveguide channel diplexer in which plural resonant cavities are coupled to a segmented circular waveguide through thin slots on a plane longitudinal surface of the guide. The slots are located to preserve circular symmetry and consequently the purity of the circular electric mode; the cavities are designed to produce a complementary bandpass-bandstop filter pair. The diplexer structure may also be modified to operate as a mode transducer.

3,668,565

LOW PROFILE WAVEGUIDE CHANNEL DIPLEXER

Gerd Achim Tuchen, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1971, Ser. No. 134,806
Int. Cl. H01p *5/12*
U.S. Cl. 333—6 **7 Claims**



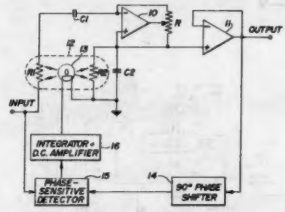
A waveguide channel diplexer in which plural resonant rectangular cavities are coupled to a segmented circular waveguide through thin slots on a plane longitudinal surface of the guide. The slots are located to preserve circular symmetry and consequently the purity of the circular electric mode; the cavities which produce a complementary band-pass-bindstop filter pair are designed to be electroformed from permanent mandrels.

3,668,566

PHASE-LOCKED TRACKING FILTER

Douglas F. Trigg, Orleans, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Dec. 10, 1970, Ser. No. 96,880
Claims priority, application Canada, Nov. 4, 1970, 097371
Int. Cl. H03h *7/10*
U.S. Cl. 333—17 **11 Claims**



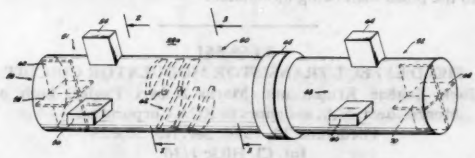
A phase-locked tracking filter in which the input and output voltages of a band-pass filter are compared as to phase and a control voltage produced to vary the characteristics of the filter to force the filter to "track" and provide maximum noise rejection of a desired input frequency. The phase comparison and feedback means includes, in the preferred version of the invention, inverting and non-inverting Schmitt triggers, a monostable multivibrator and a flip-flop phase-sensitive detector to provide a square wave voltage whose mean DC value is related to the phase difference. This voltage is used to control and vary the characteristics of the band-pass filter.

3,668,567

DUAL MODE ROTARY MICROWAVE COUPLER

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 2, 1970, Ser. No. 51,869
Int. Cl. H01p *1/16, 5/12*
U.S. Cl. 333—21 A **10 Claims**



Microwave coupling devices having input and output rotatably mounted circular waveguide sections with a phase shifter and an orthogonal mode transducer coupled to the input circular waveguide section for converting a pair of linearly polarized input signals to counterrotating circularly polarized signals. A second orthogonal mode transducer, associated with the output circular waveguide section, provides output signals of the proper phase for dual mode transmission by a multiple feed horn antenna system.

3,668,568

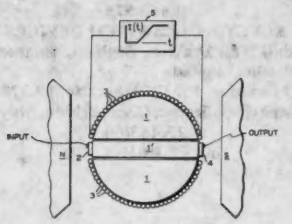
SIGNAL PROCESSING APPARATUS

Frederic R. Morgenthaler, Winchester, Mass., assignor to Chu Associates, Inc., Harvard, Mass.

Filed Oct. 6, 1969, Ser. No. 870,478
Int. Cl. H03h *7/30*
U.S. Cl. 333—30 **19 Claims**

This disclosure involves a novel and compact pulse compression filter and the like, employing elastic shear-wave,

spin-wave, longitudinal-wave transduction by means of a time-varying magnetic bias field, providing increased power



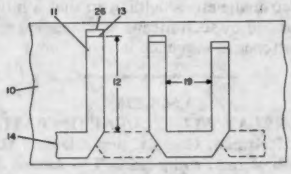
handling capability and greater compression ratios than present-day filters.

3,668,569

DISTRIBUTED-CONSTANT DISPERSIVE NETWORK

Frederick G. Herring, Wantagh, N.Y., assignor to Hazeltine Corporation

Filed May 27, 1970, Ser. No. 41,031
Int. Cl. H01p 1/18; H03h 7/28
U.S. Cl. 333—30 R **13 Claims**



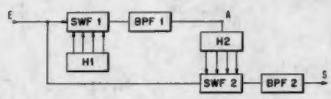
A microwave dispersive network for wideband signal processing systems is disclosed in which a plurality of all-pass, quarter-wave, coupled transmission lines constructed in dielectric stripline are connected in cascade to synthesize a desired dispersive characteristic.

3,668,570

ADAPTIVE SWITCHED FILTER ARRANGEMENT FOR USE IN RAPID FREQUENCY TRACKING

Alex Honore Lautier, Vence, and Jean Louis Monrolin, Tourettes sur Loup, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1970, Ser. No. 95,307
Int. Cl. H03h 7/10
U.S. Cl. 333—70 A **6 Claims**



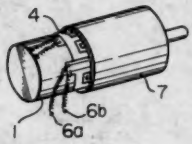
An adaptive switched filter arrangement formed from two switched filters to each of which is applied the same input signal. The first switched filter is switched at an independent predetermined frequency. The second switched filter, however, is tuned by the output frequency extracted by the first filter. This minimizes phase tracking time and cancels systematic phase error.

3,668,571

METHOD FOR ELIMINATING NOISE OF AN ELECTRIC APPLIANCE AND DEVICE THEREFOR

Masaaki Sato, and Shiniche Saitou, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Toyko, Japan

Filed Apr. 30, 1970, Ser. No. 33,363
Claims priority, application Japan, May 10, 1969, 44/42895
Int. Cl. H01h 7/14
U.S. Cl. 333—79 **18 Claims**



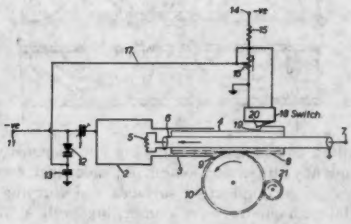
Method and device for eliminating noise of an electric appliance such as a tape recorder. The input lead wires of an electric motor incorporated in the electric appliance are made to have a predetermined length depending upon the factors such as the capacity of the motor so that the electromagnetic noise generated by the commutator and the brushes of the motor is compensated for by the length of the input lead wires thereby permitting the noise of the electric appliance is eliminated. The input lead wires are made of a printed circuit and located in any desired position in the electric appliance such as on the outer surface of the housing of the motor and on the inner surface of the casing of the electric appliance thereby permitting the same to be made extremely compact.

3,668,572

SIGNAL GENERATORS

John Alexander McHattie, Dunstable, England, assignor to Marconi Instruments Limited, London, England

Filed June 28, 1971, Ser. No. 157,309
Claims priority, application Great Britain, July 30, 1970, 36,872/70
Int. Cl. H01p 1/22, 7/06; H03j 3/06
U.S. Cl. 333—81 B **6 Claims**



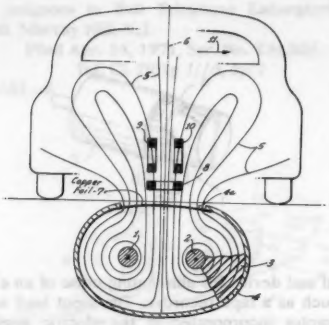
A signal generator includes a piston-in-waveguide attenuator coupled to a tuned circuit, a control voltage whose magnitude depends on the position of the piston in the waveguide of the attenuator being produced from a potentiometer and applied to a variable capacity diode in the tuned circuit. Changes in the reactance of the tuned circuit caused by the proximity of the piston are compensated by changes in the capacity of the variable capacity diode, maintaining a constant generated frequency.

3,668,573

HIGH-FREQUENCY CABLE

Helmut Martin, Hannover, Germany, assignor to Kabel-Und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Feb. 3, 1971, Ser. No. 112,306
Claims priority, application Germany, Feb. 24, 1970, P 20 08 398.1
Int. Cl. H01p 3/02
U.S. Cl. 333—84 R 7 Claims



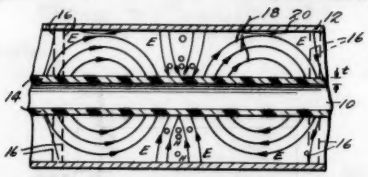
An h.f. cable with two conductors in a dielectric substance enveloped by a shield with an axial slot which is covered by a copper foil.

3,668,574

HYBRID MODE ELECTRIC TRANSMISSION LINE USING ACCENTUATED ASYMMETRICAL DUAL SURFACE WAVES

Harold Monteagle Barlow, Banstead, England, assignor to British Railways Board, London, England

Continuation-in-part of application Ser. No. 672,560, Oct. 3, 1967, now abandoned. This application Apr. 17, 1970, Ser. No. 29,626
Claims priority, application Great Britain, Oct. 7, 1966, 45,014/66; Feb. 1, 1967, 4,818/67
Int. Cl. H01p 1/16, 3/06, 11/00
U.S. Cl. 333—95 S 3 Claims



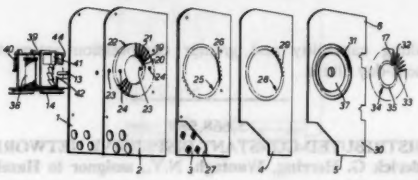
A method and means for reducing net transmission losses and frequency dispersion within an electrical transmission line having dual conducting surfaces and carrying a hybrid mode electromagnetic wave comprising both a TEM component and a dual surface wave component. One of the two conducting surfaces is caused to have more surface resistance than the other by a predetermined amount thereby making the surface wave part of the field asymmetric and enhancing the energy particularly associated with the surface wave to the detriment of the other existing components such as the TEM field. The predetermined amount of surface reactance is controlled to reduce the product of transverse attenuation and phase-change coefficients for the hybrid wave thereby causing a reduction in its overall axial attenuation coefficient in the direction of propogation. Thus the wave is slowed down by the dielectric loading, its phase-change coefficient is increased and made more nearly proportional directly to frequency.

3,668,575

ELECTRICAL SWITCH DEVICES

Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited

Filed Mar. 13, 1970, Ser. No. 19,378
Claims priority, application Great Britain, May 14, 1969, 13,463/69
Int. Cl. H01h 51/08
U.S. Cl. 335—140 22 Claims



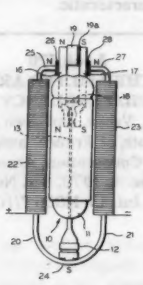
A plurality of reed switch elements are radially disposed in an arcuate formation in special channels including electrostatic and electromagnetic shielding so that a movable magnet may be rotated by such means as a stepping motor to actuate single switches in sequence.

3,668,576

FLAT PACK RELAY WITH PLURAL OPERATING COILS

Theodore M. Krizman, Osceola, and Clayton M. Emmons, Elkhart, both of Ind., assignors to The Adams & Westlake Company

Filed Nov. 5, 1970, Ser. No. 87,165. The portion of the term of the patent subsequent to Oct. 6, 1987, has been disclaimed.
Int. Cl. H01h 51/24, 51/28
U.S. Cl. 335—153 5 Claims



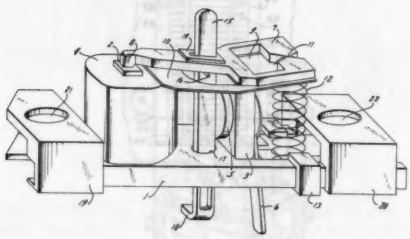
Electrical relays of the type having an armature positioned for selective contact between contact faces of pole pieces within a glass envelope under the influence of electrical flux, with or without biasing permanent magnets. Low reluctance material is connected to the exterior armature stem and extends around opposite sides of the relay and has spaced ends, each of which is magnetically coupled to one of the pole pieces of the relay. Operating coils are positioned around the low reluctance material on opposite sides of the relay envelope and are within the side projection outline of the envelope.

3,668,577

LEAKAGE CIRCUIT BREAKERS

Horst Harings, Nordenham, Germany, assignor to Felten & Guilleaume Schaltanlagen GmbH, Krefeld am Neuerhof, Germany

Filed Dec. 29, 1970, Ser. No. 98,875
Claims priority, application Germany, Jan. 2, 1970, P 20 00 138.1
Int. Cl. H01h 3/32
U.S. Cl. 335—192 21 Claims



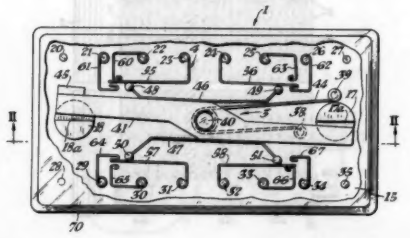
The balanced armature pivots on one pole piece and has a small contact surface that cooperates with the other pole piece. Movement of the armature is coupled to the tripping catch that operates the circuit breaker by a lever connected by an axle to the armature. One spring biases the armature open and closed when the latter is respectively closed and open. Another sprig biases the armature open at all times. The lever arms through which the springs and the magnetic attractive force act on the armature are so chosen that the magnetic tripper is highly sensitive and vibration proof.

3,668,578

LIGHTWEIGHT ELECTROMAGNETIC RELAY

Theodore C. Schroeder, Greentree, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed June 3, 1970, Ser. No. 43,114
Int. Cl. H01h 9/02
U.S. Cl. 335—202 16 Claims



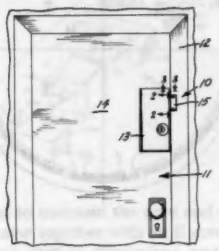
A lightweight hermetically sealed electromagnetic relay has an electromagnet, an armature, and a contact assembly. An isolation barrier is interposed between the electromagnet assembly and the armature and contact assemblies and is arranged to support each of the assemblies. A transparent cover is bonded to the isolation barrier and protects the electrical contacts against external contamination from the operating environment as well as against internal contamination from impurities emitted by the coil insulative material.

3,668,579

MAGNETIC DOOR ALARM

Bennett B. Harman, Bayside, N.Y., assignor to Door Alarm Device Corp., New Hyde Park, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,021
Int. Cl. H01h 51/28, 36/00
U.S. Cl. 335—207 1 Claim



A magnetic door alarm for use in conjunction with normally unlocked emergency exit doors of a type in which an audible signal is produced when the door is opened by unauthorized persons. The device includes a housing normally mounted on an inner surface of the door which normally swings outwardly, the housing containing a first reed switch of normally open type responsive to a magnetic field to move to a closed position. A magnet is positioned within the housing adjacent the reed switch to effect this movement. Mounted on a door jamb or frame is a larger magnet, the polarity of which is opposite that of the first mentioned magnet, so that its magnetic field cancels that of the first magnet when the door is in closed position, whereby the reed switch remains open. Upon movement of the door, the field of the second mentioned magnet is removed, and the reed switch is operated by the magnetic field of the first magnet. If an attempt is made to place an additional magnet adjacent the magnet on the door jamb, the field of the door jamb magnet is either enhanced or cancelled, so that the equilibrium condition is destroyed, and the reed switch is operated by the first mentioned magnet. Additionally, a second reed switch is provided within the casing, electrically connected in parallel with the first switch, and shielded from the magnetic field of the first mentioned and second mentioned magnets, so that unauthorized use of a third magnet in the area of the second magnet will serve to close the second switch and operate the alarm irrespective of the condition of the first mentioned switch.

3,668,580

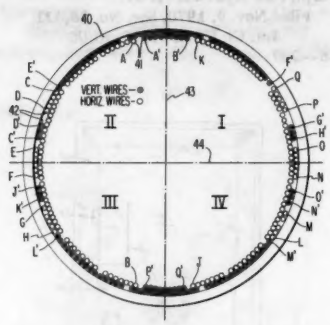
TOROIDAL DEFLECTION YOKE HAVING ASYMMETRICAL WINDINGS

Robert Lloyd Barbin, Lancaster, Pa., assignor to RCA Corporation

Filed Dec. 7, 1970, Ser. No. 95,847
Int. Cl. H01f 5/00
U.S. Cl. 335—213 8 Claims

A toroidal deflection yoke for a delta gun shadow mask color television picture tube includes windings having asymmetric conductor distributions to correct for effects such as unsymmetrical misconvergence of the electron beams across the scanned raster. For convergence which is unsymmetrical top to bottom, an asymmetric change top to bottom is made in the conductor distribution in either the horizontal or verti-

cal coil windings and for convergence which is unsymmetrical left to right an asymmetric change left to right is made in the conductor distributions in either the horizontal or vertical coil windings.

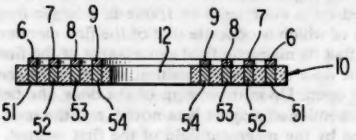


3,668,581

METHOD OF ENERGIZING FULLY PERSISTENT, HIGH FIELD, HIGH HOMOGENEITY MAGNETS

Edward Robert Schrader, Hightstown, N.J., assignor to RCA Corporation

Filed Dec. 17, 1969, Ser. No. 885,810
Int. Cl. H01f 7/22
U.S. Cl. 335—216 **12 Claims**



A superconductive magnet includes a plurality of concentric superconductor rings disposed on a substrate disc which has a bore in the center thereof. A magnetic field permeates through the rings which are then caused to be switched between a normal and a superconductive state according to a predetermined program. The shifting of the states of the rings creates a high flux density in the disc bore.

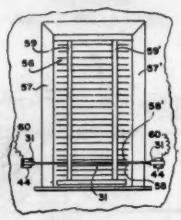
3,668,582

TRAP SWITCH CONSTRUCTIONS IN THE NORMALLY CLOSED PROTECTIVE CIRCUIT OF BURGLAR ALARM SYSTEMS

Lawrence N. Lea, No. 3601 Johnson Ave., Bronx, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 78,128
Int. Cl. G08b 13/08
U.S. Cl. 335—285 **12 Claims**

The trap includes a pliable elongated member which may be a wire, cord or tape having a steel terminal element serving as an armature releasably held by a permanent magnet structure which constitutes one end support holding the elongated member taut. When the armature is detached from the magnet by movement of some part of the protected structure, as for instance a window, a venetian blind or by movement of an intruder, the protective circuit will open, thereby actuating the alarm circuit. The magnet is one terminal of the trap switch. The armature is conductively connected in some manner to the other switch terminal. The pliable elongated member may be a wire offering part of the circuit path while the armature and magnet are engaged. Parts of the protected structure may serve as the pliable member or the armature, as for instance in an example shown, the ladder tapes of a venetian blind serve as the elongated pliable member, while the blind's base rail serves as the armature. Both supports for the pliable member may comprise a magnet and armature. In embodiments shown, a single armature is used to shunt two spaced magnets, in which instances, such pair of magnets constitute the switch terminals. The magnet structures preferrably comprise a magnetic block carried in a sheet steel channel having mounting lugs for various placements. The line of direction of the elongated pliable member, is not limited. Force required to dislodge the armature is adjustable.

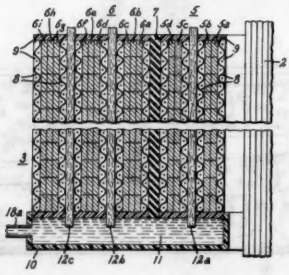


3,668,583

TECHNIQUES FOR CASTING ENCAPSULATED COILS

Thomas G. Nichols, Rome, Ga., assignor to General Electric Company

Filed May 10, 1971, Ser. No. 141,734
Int. Cl. H01f 27/10
U.S. Cl. 336—58 **8 Claims**



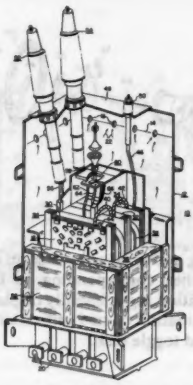
Disclosed is a vaporization cooled inductive apparatus. The apparatus comprises a winding assembly encapsulated in a cast body of solid insulating material and disposed in a sealed tank. The cast winding assembly includes at least one liquid absorbent wick and a vaporizable liquid containing reservoir. The wicks carry said liquid to hot interior regions of the winding. Condenser means are provided for recycling vapors produced during the cooling process.

3,668,584

ELECTRICAL POWER APPARATUS

Harral T. Robin, Muncie, and Virgil L. Boaz, Daleville, both of Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 13, 1971, Ser. No. 133,488
Int. Cl. H01f 27/10
U.S. Cl. 336—60 14 Claims



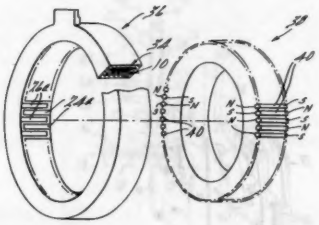
Electrical power apparatus, such as a transformer, electrical reactor, or a circuit breaker, having a casing containing fluid cooling means, and at least one electrical lead immersed in the fluid cooling means. The magnitude of the electrical stress is reduced about the electrical lead, without impeding the removal of heat from the lead by the fluid cooling means, by disposing a spirally wound electrode about the electrical lead, and connecting the electrode to the lead.

3,668,585

ELECTROMAGNETIC DEVICE WITH CAST MAGNETIC PATH

Howard R. Johnson, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of application Ser. No. 817,655, Apr. 21, 1969, now abandoned. This application Mar. 1, 1971, Ser. No. 119,951
Int. Cl. H01f 15/02
U.S. Cl. 336—83 4 Claims



An electromagnetic device utilizing a coil and having a cast magnetic path around the coil and a method of manufacture.

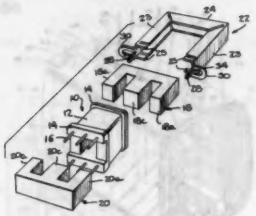
3,668,586

TRANSFORMER-INDUCTOR FRAME AND KIT

Stephen Horbach, Mountain Lakes, N.J., assignor to Electronic Associates, Inc., West Long Branch, N.J.

Filed Mar. 8, 1971, Ser. No. 121,826
Int. Cl. H01f 27/26
U.S. Cl. 336—210 8 Claims

A transformer or inductor frame for holding together two E cores and a coil. The transformer frame includes two leaf springs integral with the back of the frame and having bendable tabs integral with the forward portion of the legs of the frame. The tabs and spring act together to hold the two E cores together and to maintain the core and coil assembly in the frame. The frame together with an E core having slightly increased leg cross section dimensions and a bobbin constitutes a kit for the winding of a transformer or inductor.

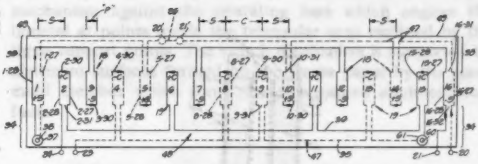


3,668,587

MULTI-LAYER POLYPHASE WINDING MEMBER AND TRANSFORMER

Vincent F. Foster, New Rochelle, N.Y., assignor to Inductosyn Corporation, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,913
Int. Cl. H01f 21/04
U.S. Cl. 336—123 19 Claims



Disclosed is a polyphase member for a position measuring transformer formed by multiple layers of printed circuit active and inactive conductors. The inactive conductors connect the active conductors to form winding sections and the winding sections are interconnected by printed circuit inactive conductors to form polyphase windings. Each layer includes groups of conductors including a predetermined number, usually an equal number, of active conductors of first and of second cofunction, e.g., sine or cosine, types. The winding sections are positioned with a specific phase relationship, such as quadrature, to a reference winding. The active conductors on each layer of the polyphase member are positioned such that a blank area called an active conductor void or gap, occurs where normally in a periodic configuration an active conductor would be positioned. Still further, the layers are complementary in that they are combined into a multi-layer member so that the active conductors on one layer are superposed the active conductor voids or gaps on another layer whereby the multi-layers as a whole present to the reference winding uniformly spaced active conductors.

3,668,588

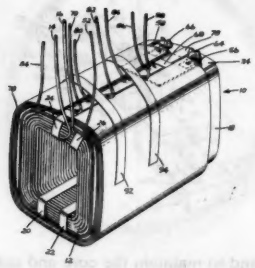
ELECTRICAL COIL ASSEMBLY

Henry Walsh, Jr., Danville, Ill., assignor to General Electric Company

Filed Oct. 19, 1970, Ser. No. 81,930
Int. Cl. H01f 15/10
U.S. Cl. 336—192 5 Claims

An electrical coil assembly wherein two or more separate windings are formed in the same intermediate layer of a

layer-wound coil. A formed insulating board is provided for insulating and positioning the pair of conductors from each winding which are brought out toward the margin of the coil



assembly. Additional layers of insulating material and other electrical windings are wound over the layer having two or more separate windings.

3,668,589

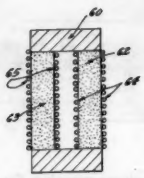
LOW FREQUENCY MAGNETIC CORE INDUCTOR STRUCTURE

Bruce L. Wilkinson, Torrance, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Dec. 8, 1970, Ser. No. 96,005

Int. Cl. H01f *27/24*

U.S. Cl. 336—212 **4 Claims**



A low frequency magnetic core inductor is provided which exhibits the desirable high quality factor (Q) and low external magnetic field of the prior art toroidal type inductor, but which is constructed to have a bobbin-like configuration for ease of assembly and winding the inductor winding on the core, and for compactness of size and efficient use of available space.

3,668,590

LONG PULSE DIURNAL TIMER

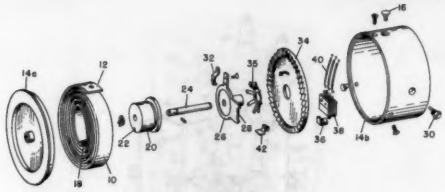
Donald Brown, Southampton, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed May 25, 1971, Ser. No. 146,765

Int. Cl. H01h *61/00*

U.S. Cl. 337—51 **6 Claims**

A long pulse diurnal timer for initiating a utilization means, said timer comprising: a coiled bimetal spring having a fixed end and free end, said spring, through its physical expansion, responding to daily sinusoidal changes in temperature via angular displacements at the free end of said spring; a clutch means, said clutch means having its input engagement fixed to the free end of said coiled bimetal spring, said clutch means advancing angularly in response to each daily expansion of said coiled bimetal spring; a pawl means, said pawl means attached to the periphery of said clutch means; a unidirectional ratchet means having an actuation lug, said ratchet means biasingly coupled to said pawl means, said ratchet means being advanced one notch by said pawl means in response to the daily movement of said clutch means; a toggle disk disposed in the path of said actuation lug, said



toggle disk being activated only after an advance of a number of ratchet notches corresponding to the angular distance which said actuation lug is initially displaced from said toggle disk, wherein initiation of said utilization means occurs upon activation of said toggle disk.

3,668,591

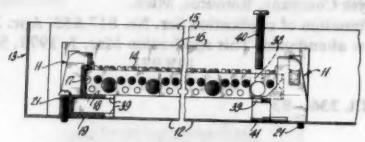
BUS BAR FOR ELECTRIC CONNECTIONS

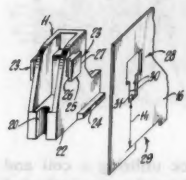
Herman H. Kobryner, Forest Hills, N.Y., assignor to Murray Manufacturing Corporation, Jericho, N.Y.

Continuation of application Ser. No. 878,154, Nov. 19, 1969, now abandoned. This application Nov. 23, 1970, Ser. No. 92,220

Int. Cl. H01r *9/00, 7/12*

U.S. Cl. 339—198 N **13 Claims**





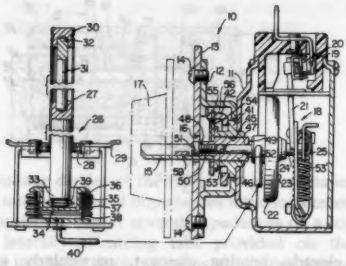
The invention contemplates a construction for parts of a neutral bus-bar assembly whereby the assembly can be unit-handling without requiring tools or special fasteners, such as bolts, to complete the assembly. At the same time, the unit-handling assembly achieves the added function of providing an insulating shield for the bus-bar and all electrical connections thereto.

3,668,592

CONTROL DEVICE AND METHOD FOR CALIBRATING THE SAME OR THE LIKE

Cloyd E. Decker, Indiana, Pa., assignor to Robertshaw-Controls Company, Richmond, Va.

Filed Feb. 18, 1970, Ser. No. 12,222
Int. Cl. H01h 37/20, 37/36
U.S. Cl. 337—319 7 Claims



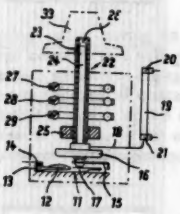
Calibrating the control shaft means and a set screw of the control shaft means so that upon a loss of fluid in an adjustable expansible and contractible power element of the control device that operates an electrical switch thereof, a subsequent movement of the set screw in a switch closing direction will be limited by stop means before that set screw can cause closing of the switch whereby a fail-safe control device is provided.

3,668,593

REGULATOR

Karl Fischer, Oberderdingen, Am Gansberg, Germany

Filed Apr. 20, 1970, Ser. No. 29,865
Claims priority, application Germany, Apr. 23, 1969, P 19 20 550.6; P 19 20 552.8; P 19 20 553.9
Int. Cl. H01h 37/10, 37/20, 37/36
U.S. Cl. 337—319 5 Claims



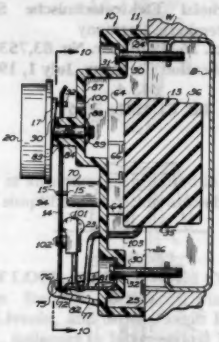
A regulator for regulating the electrical current supplied to an electrical apparatus by intermittently switching on and off said current. The regulator includes an electrically-heated expansion system acting on an electric switch for the apparatus. The invention calls for a pressure cell for bearing on the switch which is hydraulically connected to a hydraulic chamber remote from said pressure cell, an expansible liquid being contained in the hydraulic system and electric heating means being provided for treating the expansible liquid contained in the hydraulic chamber, such heating being dependent upon the magnitude of the current supplied to said electrical apparatus.

3,668,594

ROOM WALL THERMOSTAT

Andrew Kulick, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Oct. 21, 1970, Ser. No. 82,767
Int. Cl. H01h 37/14, 37/20, 32/52
U.S. Cl. 337—380 4 Claims



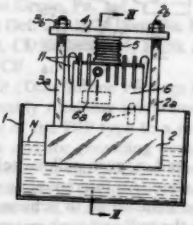
A wall thermostat comprises a molded panel frame attachable to a room wall. A switch mechanism and a plate type bimetal are supported on opposite sides of the panel with operating bars between the bimetal and switch. The bimetal is urged against three support points, comprising two spaced abutment surfaces on the frame and an adjusting cam carried by the frame by the reaction of the switch actuating mechanism against the operating bars which engage the bimetal at points inside the triangular area outlined by the three support points. The switch mechanism is supported by abutment surfaces formed on the frame panel by the same mold member which forms the two spaced abutment surfaces.

3,668,595

LIQUID RESISTOR APPARATUS

Norbert Roger Beyrard, 24 avenue Raphael, Paris, France

Filed Aug. 20, 1970, Ser. No. 65,512
Claims priority, application France, Aug. 27, 1969, 6929313
Int. Cl. H01c 13/00
U.S. Cl. 338—38 10 Claims



Liquid resistor apparatus in which a conductive liquid presents an adjustable electrical resistance between two immersed electrodes, adjustment being made by raising or lowering the level of the liquid, the level of the electrodes or

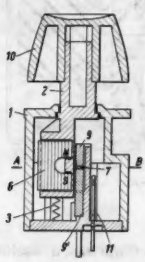
the level of a partition between the electrodes. The raising and lowering is effected by a mechanical linkage which is coupled to a bellows or piston actuated by vapor from a controllable vapor generator.

3,668,596

MAGNETIC KEYS

Rudolf Hubrich, Ravensburg, Germany, assignor to Rafi Raimund Finsterholzl Elektrotechnische Spezialfabrik, Ravensburg/Wurttemberg, Germany

Filed Oct. 26, 1970, Ser. No. 83,753
Claims priority, application Germany, July 1, 1970, G 70 24 643.4
Int. Cl. H01c 7/16
U.S. Cl. 338—32 R 10 Claims



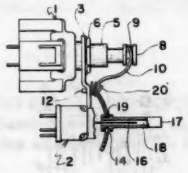
A magnetic key suitable for use with electronic equipment comprises a magnetically controllable semiconductor device mounted between two soft iron pole pieces, and a permanent magnet movable relative to the device. The magnet is carried by a slide movable between two positions and biased by a spring towards one of the positions. In one position only a substantial part of the magnetic flux of the magnet passes through the device, so the condition of the device can be controlled by movement of the slide.

3,668,597

SLIDE RHEOSTAT AND PUSH-PULL SWITCH ASSEMBLY

Yukihiko Nomura, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed June 10, 1971, Ser. No. 151,889
Claims priority, application Japan, June 11, 1970, 45/57652
Int. Cl. H01c 9/08
U.S. Cl. 338—198 4 Claims



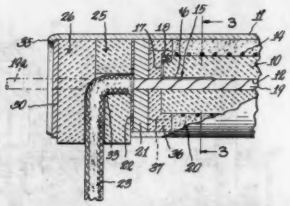
A slide rheostat and a push-pull switch are assembled together by a fixed plate. An intercoupling drive plate is engaged with the fixed plate so as to achieve a seesaw movement in response to the pull and push operation of a knob in the center hole of which is inserted a control lever of the slide rheostat, the knob being freely movable in a slit formed in the intercoupling drive plate. A shaft of the switch is coupled to the intercoupling drive plate so that in response to the seesaw movement of the drive plate the switch is switched ON and OFF.

3,668,598

ELECTRIC HEATING ELEMENTS

Lester D. Drugmand, and Lloyd S. Kozbelt, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 23, 1970, Ser. No. 83,429
Int. Cl. H01c 1/14
U.S. Cl. 338—274 7 Claims



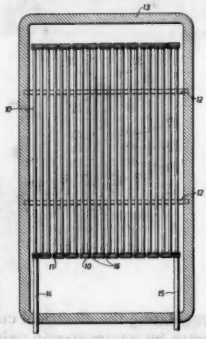
An electric heating element, particularly a cartridge heater, having leads connected to the resistor for leading current to the latter from a source. Insulator means are held in the end of the sheath and have passages through which the leads extend, each passage having an inner portion disposed parallel to the longitudinal axis of the sheath and an outer portion disposed at an angle to the inner portion, to conform the flexible lead to extend angularly relative to the sheath longitudinal axis.

3,668,599

ELECTRICAL RESISTANCE ELEMENT

Nils Gustav Schrewellius, Hallstahammar, Sweden, assignor to Aktiebolaget Kanthal, Hallstahammar, Sweden

Filed Sept. 15, 1970, Ser. No. 72,454
Claims priority, application Sweden, Sept. 16, 1969, 12710/69
Int. Cl. H01c 1/02
U.S. Cl. 338—289 5 Claims



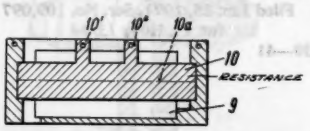
An electrical resistance element formed of an array of parallel $MoSi_2$ rods coupled in series by connecting adjacent rod ends together in pairs at one end of the array and at the other end connecting adjacent rod ends together in pairs staggered with respect to those at the first end. The connection is made by means of a flame-sprayed layer of MoSiAl or $MoSi_2$ and the array is supported by an elastic cross bar in a ceramic frame.

3,668,600

LAYER VOLTAGE DIVIDER WITH ADDITIONAL IMPEDANCES

Christian Schuberth, Herschfeld, Germany, and Wolf-Erhard Steigerwald, Porto, Portugal, assignors to PREH Elektro-Feinmechanische Werke Jakob Preh Nachf., Bad neustadt/Saale, Germany

Filed Nov. 16, 1970, Ser. No. 89,766
Claims priority, application Germany, Nov. 22, 1969, P 19 58 679.9
Int. Cl. H01c 1/16
U.S. Cl. 338—320 6 Claims



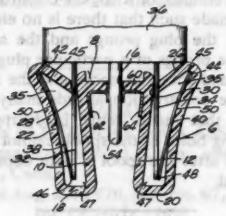
A layer voltage divider of the type having a resistance web and one or more additional impedances attached thereto, the divider comprising : one or several impedances on a supporting plate, laterally extending tabs provided on the impedance, an insulating layer covering the impedance or impedances to the exclusion of their taps, a resistance web being placed on the insulating layer and having taps, the taps of the resistance web being conductingly connected to the taps of the said one or more impedances.

3,668,601

CONTINUOUS ELECTRICAL OUTLET WITH GROUND

Robert W. McFarlin, P.O. Box 573, Pompano Beach, Fla.

Filed July 13, 1970, Ser. No. 54,377
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 7 Claims



An elongated electrical outlet having an extruded case is provided with electrical contacts and with a ground inserted longitudinally into the case where it is engaged by the ground prong of a plug when the electrical contact prongs of the plug engage the electrical contacts of the outlet. The cross section of the case permits the use of flat contact strips and concurrently provides support for the ground contact.

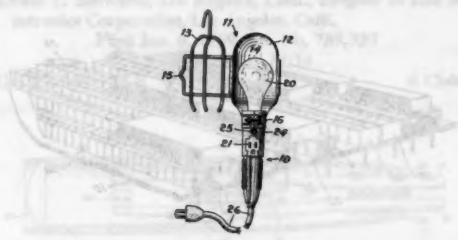
3,668,602

PORTABLE SAFETY LAMP STRUCTURE

Richard H. Griffin, Riverside, R.I., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 26, 1970, Ser. No. 67,018
Int. Cl. H01r 3/06, 13/48
U.S. Cl. 339—14 R 8 Claims

A portable safety lamp includes a socket assembly, an elongated hollow dielectric handle for housing the socket assembly therewithin and a wire mesh cage for protecting a light bulb screwed into the socket assembly. The socket assembly includes a pair of contacts that interconnect an extension cord to the socket assembly, and a freely detachable unitary dielectric adapter that acts as a spacer and resilient retainer of the pair of contacts. The adapter and the pair of contacts are uniquely designed so that they provide two-pronged and three-pronged outlets. The adapter eliminates a large number of structural pieces used in the prior art socket assembly and simplifies the socket assembly manufacture.

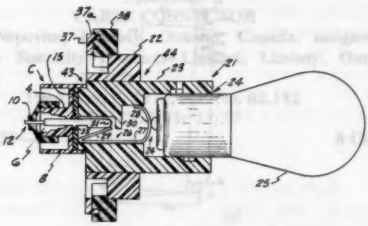


3,668,603

TWIST LOCK SOCKET WITH CONNECTOR

James Patton Burgess, Brighton; Melvin William Polkinghorn, Livonia, and Steve Joseph Brzozowski, Detroit, all of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 2, 1970, Ser. No. 68,995
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 14 Claims



Connector and lamp socket structures are disclosed for use in establishing electrical connections between wiring harnesses and lamps. An exemplary lamp socket is designed to provide fool-proof housing panel orientation during installation and a positive pressure interlock assuring a water tight connection with the panel housing.

3,668,604

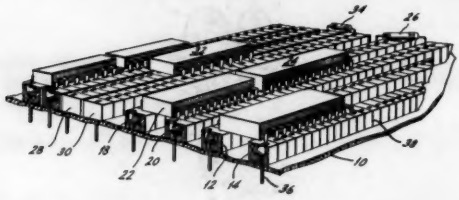
STRIP-TYPE DIP RECEPTACLE

Donald W. Rossman, Jenkintown, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Filed Oct. 21, 1970, Ser. No. 82,672
Int. Cl. H01r 33/76; H05k 1/16
U.S. Cl. 339—17 CF 4 Claims

A strip-type DIP (Dual In-line Package) receptacle for use in pairs for removably retaining integrated circuits (IC's) or other components of the DIP type to a printed circuit board or other substrate and for providing contact tails which are electrically connected to the leads of the IC and which extend from the underside of the substrate so that interconnections between leads of IC's can be effected economically or automatically. The receptacle comprises a strip-shaped main insulator, a plurality of contacts, and a strip-shaped side insulator which preferably is welded ultrasonically to the main insulator after the nose portions of the contact are positioned in cavities of the main insulator. Each contact comprises straight, aligned body and tail portions and a thinner, C-shaped nose portion having a mating surface which is offset

from the axis of the body and tail portions. Because of said offset feature, adjacent strips may be mounted in alternate orientations (preferably by a force fit into plated-through



holes in a PC board), thereby to provide uniformly-spaced contact tails under IC's mounted with non-uniform lead spacing.

3,668,605

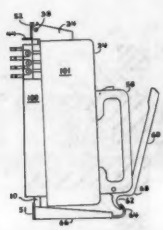
MULTI-POINT PROGRAM PLUG AND RECEPTACLE CONNECTOR ARRANGEMENT HAVING POSITIVE ALIGNMENT PRIOR TO POSITIVE MATING

Guy D. Albert, Galion, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Aug. 10, 1970, Ser. No. 62,434

Int. Cl. H01r *25/00, 13/54*

U.S. Cl. 339—18 B **8 Claims**



A multi-point connector arrangement including separable plug and receptacle members each having a frame portion with a selected profile camber to insure full positive engagement of the contact elements during coupling, and having cooperable interengaging portions adapted to effect proper alignment during mating of the plug and receptacle members.

3,668,606

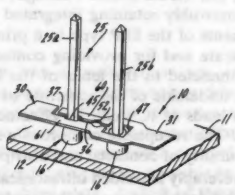
BUSS CONNECTOR

George Walter, Westchester, Ill., assignor to Malco Manufacturing Company, Inc., Chicago, Ill.

Filed Oct. 8, 1970, Ser. No. 79,095

Int. Cl. H01r *31/08*

U.S. Cl. 339—19 **8 Claims**



An electrical buss connector for bussing together a series of plate mounted wire-wrap pins. The connector comprises a flat strip of metal which is provided with elongated slots at intervals along its length. Cut-outs are formed in opposed edges of each slot between its ends for locating and gripping prescribed pins when the strip is pressed down on the pins. The sharp edges of the cut-outs wipe and clean the pins as the strip is forced downwardly on them so as to assure an excellent electrical connection, while the strip assumes a low profile configuration with the mounting plate.

3,668,607

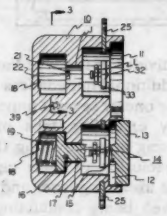
ELECTRICAL SOCKET

Ivan A. Farnworth, 441 South State, Orem, Utah

Filed Jan. 25, 1971, Ser. No. 109,097

Int. Cl. H01r *13/44*

U.S. Cl. 339—41 **9 Claims**



An electrical socket device incorporating at least one spool constructed to receive the prongs of an electrical plug. The spool is rotationally displaceable and coacts with the remainder of the socket structure such that the plug prongs can be locked in place upon suitable rotational displacement of the spool, and this for the purpose of providing direct electrical connection as between the plug prongs and the electrical terminals or contact of a socket construction. A socket construction is made such that there is no electrical connection as between the plug prongs and the socket electrical contacts until the prongs of a particular plug are inserted in the aforementioned rotatable spool and the spool depressed and rotated. The construction affords many safety features for children so that metal items, inadvertently positioned through the prong holes of the spool, cannot make electrical connection until after the spool is both depressed and rotationally displaced.

3,668,608

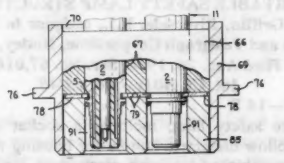
COAXIAL CONNECTOR MOUNTING MEANS

George William Ziegler, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original application May 27, 1968, Ser. No. 732,447, now Patent No. 3,566,334. Divided and this application Sept. 18, 1970, Ser. No. 73,653

Int. Cl. H01r *13/62*

U.S. Cl. 339—64 M **3 Claims**

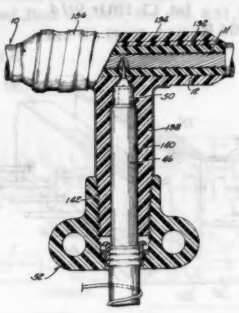


Coaxial connector mounting means comprises mounting block means connectable together to connect coaxial connector means floatably mounted in the mounting block means.

3,668,609
HOT LINE CONNECTOR

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Continuation-in-part of application Ser. No. 820,142, Apr. 29, 1969, now abandoned. This application Mar. 30, 1970, Ser. No. 23,823
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 R 16 Claims

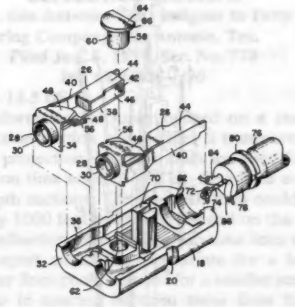


Disclosed herein is a tapping device including a resilient insulator which can be shrunk or taped into sealing engagement with the exposed cable insulation of a high voltage cable, the device including a passage to sealingly engage a cable lead, the cable tap lead having a probe to penetrate the cable insulation and electrically engage the electrical conductor for a high voltage cable, and a drive assembly to force the cable lead through the passage until the probe penetrates the cable insulation and electrically engages the cable conductor. The insulator can also be used to seal a Tee type cable splice.

3,668,610
LOCK-IN ELECTRICAL JACK ASSEMBLY

William H. Flanagan, Stamford, Conn., assignor to Nexus, Inc., Stamford, Conn.

Filed Aug. 27, 1970, Ser. No. 67,305
Int. Cl. H01r *13/62*
U.S. Cl. 339—74 R 3 Claims

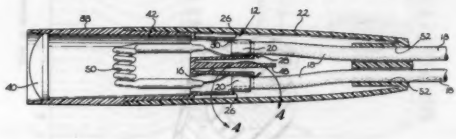


A lock-in electrical jack assembly for utilization with a communications system adapted for interlocking engagement with a mating component and having an integral push-button for disengaging the interlock for removal of the components.

3,668,611
ELECTRICAL CONNECTOR ASSEMBLY AND TIMING LIGHT EMBODYING SAME

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Jan. 6, 1969, Ser. No. 789,337
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 R 6 Claims

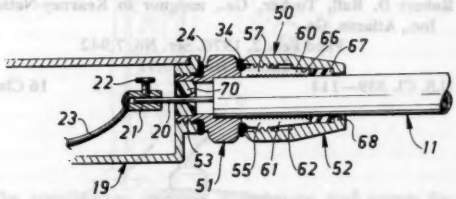


An electrical connector assembly for engine timing lights and other uses. The connector assembly embodies releasable electrical plug and socket coupling means which may be separated only by lateral movement of each coupling plug relative to its receiving socket, and a retainer sleeve surrounding the coupling means in such a way as to prevent such relative lateral separation movement and, thereby, separation of the coupling means. The disclosed embodiment of the invention is an engine timing light which utilizes the connector assembly to attach the leads of the timing light to the terminals of the timing lamp.

3,668,612
CABLE CONNECTOR

Zdenek Nepovim, Lindsay, Ontario, Canada, assignor to Lindsay Specialty Products Limited, Lindsay, Ontario, Canada

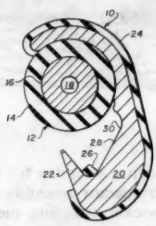
Filed Aug. 7, 1970, Ser. No. 62,112
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 C 8 Claims



A connector for attachment to the end of a coaxial cable having an axial core electrode or conductor and a conductive sheath electrode or conductor includes a housing having an integral tubular skirt formed from four rearwardly extending tongues collectively formed with a rearwardly facing external cam surface. A tubular cover sleeve formed with a forwardly facing internal cam surface for engagement with the external cam surface of the tongues screws onto the housing so that interaction of the cam surfaces causes the tongues to be flexed radially inwardly into gripping engagement with a cable disposed within the connector and into electrical contact with the conductive sheath electrode of that cable. Usefully, a radially inwardly compressible and electrically conductive collet sleeve is coaxially disposed within the tongues between their forward and rearward ends so as to receive an exposed forward end portion of the core electrode of the cable. An electrically insulating and radially inwardly compressible bushing disposed about the collet sleeve serves to transmit radially inward movement from the tongues to the collet sleeve so as to provide simultaneous gripping of the

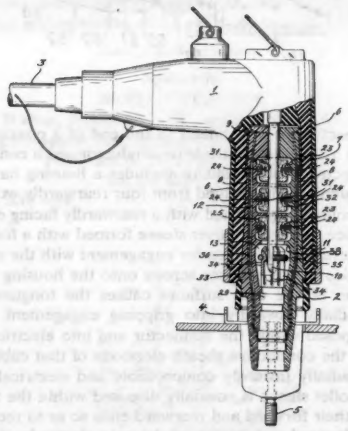
core electrode without any torsional shearing action between the sheath and core electrodes.

3,668,613
ELECTRICAL CONNECTOR
John J. Klosin, P.O. Box 0320, East Brunswick, N.J.
Filed Jan. 22, 1970, Ser. No. 5,011
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 C 21 Claims



An electrical connector for cables and the like having a current carrying means, a deformable attaching body adapted to at least partially surround a length of the cable, and at least one tooth-shaped penetrating member in electrical contact with the current carrying means of the connector. The attaching body is positioned about the cable and fixed to the cable by means of a compression tool or the like which at least partially deforms the attaching body causing the penetrating member to pierce the cable insulation and contact the inner conductive core of the cable. All external surfaces of the connector may be fully insulated including the penetrating members. Insulation on the connector may be used to seal the connection between the connector and the cable to provide a weatherproof insulated connection.

3,668,614
SEPARABLE ELECTRICAL CONNECTORS
Robert D. Ball, Tucker, Ga., assignor to Kearney-National Inc., Atlanta, Ga.
Filed Feb. 2, 1970, Ser. No. 7,942
Int. Cl. H01r *15/12*
U.S. Cl. 339—111 16 Claims

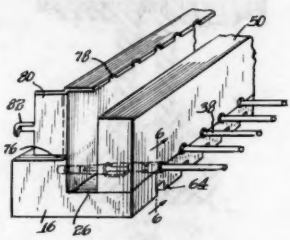


Compound copulatory separable connector with integrated arc-controlling means adapting it for safe use as a load-break and load-make switch.

ERRATUM

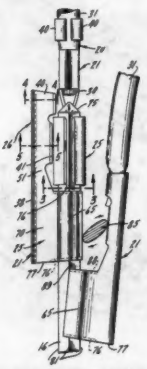
For Class 339—198 OON see:
Patent No. 3,668,591

3,668,615
MULTI-CONDUCTOR ELECTRICAL SOCKET AND METHOD OF MAKING THE SAME
Allen J. Bury, Prospect Heights, Ill., assignor to Molex Incorporated, Downers Grove, Ill.
Filed May 19, 1970, Ser. No. 38,786
Int. Cl. H01r *9/14*
U.S. Cl. 339—206 R 8 Claims



A multi-conductor electrical socket comprising a substantially rectangular and partially hollow insulating housing with a plurality of external insulated electrical lead wires extending into one end of the housing and terminating therein. Each lead wire is connected or crimped at its housed end to one end of a terminal for electrical connection therewith, the other end of each terminal being exposed for engagement with an external plug. Prior to the crimping operation, the terminals and lead wires are placed on a platform or base of the housing where they are thereafter simultaneously connected or crimped together, utilizing the platform or base as an effective anvil.

3,668,616
RECEPTACLE
Frank A. Kukla, Cicero; Harold B. Kalmar, Des Plaines, and John A. Petkunas, Westchester, all of Ill., assignors to Malco Manufacturing Company, Inc., Chicago, Ill.
Continuation-in-part of application Ser. No. 638,385, May 15, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 13,328
Int. Cl. H01r *11/22*
U.S. Cl. 339—258 R 10 Claims



A clip-type connector for joining a conductor to a generally square or rectangular cross-section terminal post.

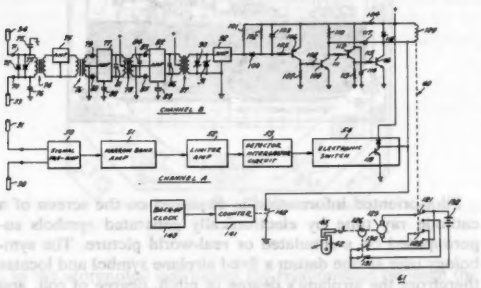
Resiliently spreadable connector walls grip the side surfaces of the post regardless of variations in its shape or dimensions. Orientation of the connector on a post is such that multiple connectors may be stacked on adjacent posts. A connector may be simply and expeditiously removed from anywhere in a stack of connectors on a post.

3,668,617

UNDERWATER COMMUNICATION SYSTEM

Edward C. Brainard, II, Marrian, Mass., assignor to General Time Corporation, Stamford, Conn.

Filed June 9, 1969, Ser. No. 831,546
Int. Cl. H04b *13/02*
U.S. Cl. 340—4 E **23 Claims**



An underwater communication system wherein communication is achieved through an alternating electric field between spaced-apart pairs of transmitting and receiving electrodes in conductive contact with the water. The transmitting and receiving electrodes are horizontally oriented and two pairs of orthogonally disposed receiving electrodes can be used to provide omnidirectional communication. The receiver is responsive only to properly coded signals. According to one embodiment the receiver responds only to signals of a selected frequency and duration, and is not effected by short bursts of noise or the cumulative effect of short signals. According to other embodiments various different coding and redundancy techniques are employed.

3,668,618

IDENTIFICATION AND CLASSIFICATION OF SEISMIC REFLECTION VELOCITY PROPERTIES ON SEISMIC REFLECTION SECTIONS

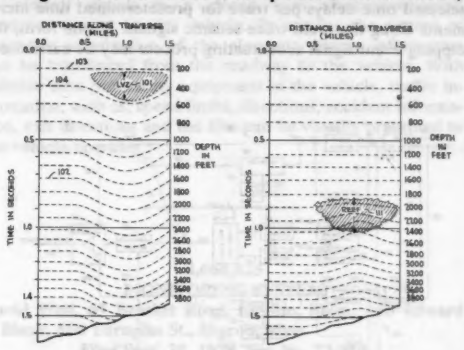
Roy G. Quay, San Antonio, Tex., assignor to Petty Geophysical Engineering Company, San Antonio, Tex.

Filed Jan. 5, 1970, Ser. No. 778
Int. Cl. G01v *1/00*
U.S. Cl. 340—15.5 DS **7 Claims**

Velocity information is superimposed on a conventional seismic reflection section using either a transparent overlay or an optical projection. Isodepth lines are used for conventional reflection time sections and iso-time lines are used for reflection depth sections. The isodepth lines could be in the order of every 1000 feet but would depend on the time scale used on the reflection time section. Iso-time lines spaced ten milliseconds apart could be appropriate for a long depth scale and fewer lines could be used for a smaller scale.

The change in spacing between these lines for specific reflections denotes a change in the interval velocity, hence stratigraphic changes which can be used to locate stratigraphic traps for minerals. The isodepth lines also permit conversion of seismic reflections on a reflection time section to depth lines. Iso-time lines convert data on a reflection depth section to a time scale.

Either isodepth lines or iso-time lines can be used to identify changes in interval velocities for specific zones of interest,



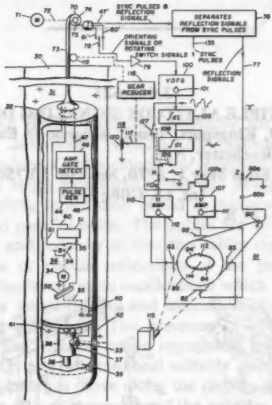
to determine the average vertical velocity to selected reflections, and to show where velocity anomalies exist.

3,668,619

THREE-DIMENSIONAL PRESENTATION OF BOREHOLE LOGGING DATA

Charles L. Dennis, De Soto, Tex., assignor to Mobil Oil Corporation

Filed July 2, 1969, Ser. No. 838,533
Int. Cl. G01v *1/28, 1/40*
U.S. Cl. 340—15.5 BH **25 Claims**



The specification discloses a technique and system for recording, on a two-dimensional recording medium, data obtained from cyclic scanning operations carried out angularly around the wall of the borehole at each of a plurality of different depths wherein subsurface parameters are sensed during each scanning operation. In one embodiment, a plurality of loop-shaped trace patterns, preferably in elliptical form, are recorded in the form of a helix to form a representation of the borehole wall. Different sides of the helix may be intensified or half sections of the helix recorded to illustrate different sections of the borehole wall.

3,668,620

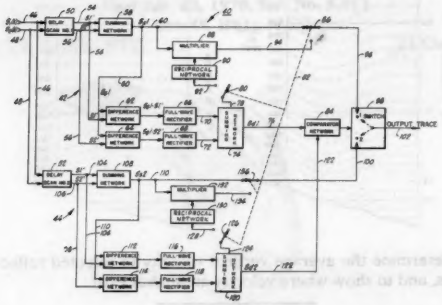
METHOD AND APPARATUS FOR DETERMINATION OF SEISMIC SIGNAL EVENT COHERENCE

Paul G. Mathieu, Pittsburgh, Pa., and Paul V. Lindblade, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 25, 1969, Ser. No. 844,893
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 CC **12 Claims**

A method and apparatus for processing multitrace seismic signals to determine the most coherent dip attitude for any

selected point in time. The method serves to accentuate similar event signals from a plurality of seismic traces at selected time delays per trace for predetermined time increments along the multi-trace seismic signals. In one form, the dipping event signal accentuating process may be carried out



by combining each of the plural traces of selected time delays per trace to derive a plurality of signals each indicative of a selected step-out or dip angle, and thereafter combining the plurality of signals to produce an output signal indicative of the most coherent dip attitude.

3,668,621

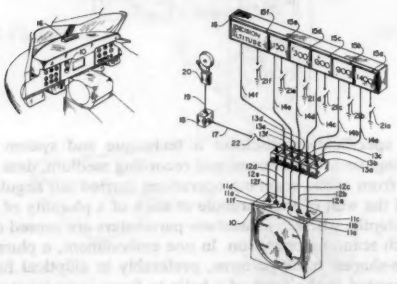
MULTIPLE ALTITUDE SIGNALING DEVICE

Carl L. Boyd, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1970, Ser. No. 33,756

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 R **8 Claims**



An apparatus particularly suitable for use during aircraft landing and departures under conditions of minimum visibility wherein a signal is provided to the pilot of the aircraft when the aircraft has reached any one of a series of preselected altitudes. The apparatus consisting of an altitude sensing device adapted to provide an output pulse as the aircraft reaches each of a series of preselected altitudes, an actuating device capable of receiving the pulse, interpreting the pulse and activating the appropriate portion of the signaling device, and a signaling device capable of warning the pilot of the aircraft altitude while he is looking through the aircraft wind screen.

3,668,622

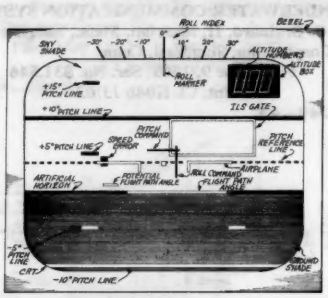
FLIGHT MANAGEMENT DISPLAY

James R. Gannett, Redmond; Gordon D. Annin, Bellevue, and Bradley K. Gjerding, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 21, 1970, Ser. No. 39,370

Int. Cl. H01r *13/44*

U.S. Cl. 340—27 R **19 Claims**



Pilot-oriented information is displayed on the screen of a cathode ray tube by electronically generated symbols superimposed on a simulated or real-world picture. The symbology uses as one datum a fixed airplane symbol and locates therefrom the airplane's degree of pitch, degree of roll, and the horizon. In addition, symbols are provided to indicate the relative position of the airplane with respect to ILS localizer and glide slope signals, pitch and roll commands obtained from an on-board flight director computer, a desired pitch reference, and actual as well as potential flight path angle. Deviation from a preset airspeed and radio or radar altitude are also shown. In all cases, the symbols are constructed by symbol generators from one or more basis rectangles, whose width is determined by a pulse of appropriate length during the CRT's horizontal scanning period, and whose height is determined by a similar pulse during the vertical scanning period. The location of each rectangle is determined by the delay between the start of the vertical or horizontal scanning period, and the start of the vertical or horizontal pulse. Modifications are described for generating rotating symbols. The outputs of the symbol generators are combined as a priority circuit and converted into a composite video signal by a video mixer.

3,668,623

AIRCRAFT VERTICAL FLIGHT POSITION DISPLAY INSTRUMENT

James Csaposs, Maywood, N.J., assignor to The Bendix Corporation

Filed Aug. 14, 1969, Ser. No. 850,161

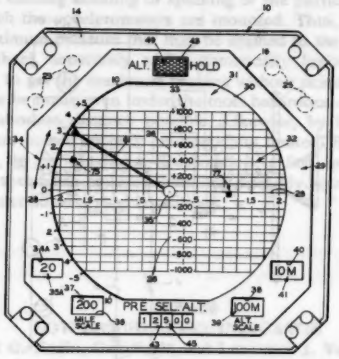
Int. Cl. B64d *45/00*

U.S. Cl. 340—27 NA **41 Claims**

An aircraft instrument for providing a pictorial display of a vertical plane position of an aircraft, helicopter or other space operated vehicle in flight in relation to radio navigation aids or other selected reference points on the ground or in space. The instrument utilizes a computing device to establish the location of the references with respect to the vehicle in flight and the vertical pictorial display portrays the vehicle as a moving symbol, such as a red dot of light or other indicator means, positioned on a grid in a manner that shows the actual vehicle altitude above or below the reference point, distance of the vehicle from a reference point, and the vertical plane angle which would lead directly to the reference point.

The instrument also includes means to provide a display of a selected or computed angular path to the same reference

point so that an observer may readily determine whether the vehicle is following a proper flight path or whether it is possible to follow the proper path from the vehicle's present position in flight. Additional means are also provided in the instrument to display the relative vertical plane position of another reference point, on the ground or in space in relation to the same vertical plane by portraying the second reference point at another symbol, such as a blue dot of light or other suitable indicator means on the same grid.



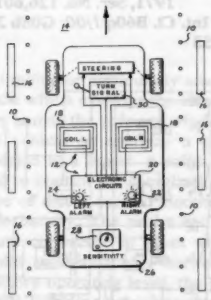
In the aforenoted instrument the relationships between the elements of the display is established so as to correspond to a mental image such as may be usually maintained by the pilot of the vehicle as he operates the vehicle in flight. In such manner the display serves to correlate and update the pilot's mental image with a minimum of confusion or interruptive mental action as the vehicle may rise or descend using vertical aimpoints or references.

3,668,624

METHOD AND APPARATUS FOR VEHICLE CONTROL AND GUIDANCE

David B. Spaulding, Carlisle, Mass., assignor to Novatek, Inc., Burlington, Mass.

Filed Nov. 20, 1969, Ser. No. 878,407
Int. Cl. G08g *1/09*
U.S. Cl. 340—32 **9 Claims**



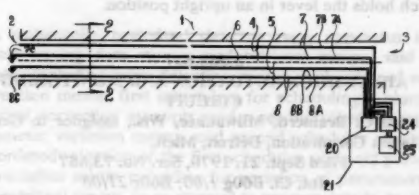
A vehicle guidance and control system for providing information concerning the speed and direction of movement of a vehicle along a predetermined path on a roadway. The path is defined by a plurality of spaced, permanently magnetized elements located along the roadway. Vehicle mounted sensors respond to the magnetic fields of the elements and produce electrical signals representing the speed and direction of movement of the vehicle with respect to the path. In one embodiment, the electrical signals are employed as control signals in a closed loop electromechanical guidance system for the vehicle. By varying the pattern of magnetic polarization of the elements, binary information can be transferred from the roadway to the vehicle. With suitable data processing equipment in the vehicle, traffic information, such as, speed limits, directions, accident information, exit directions and the like can be visually presented to the vehicle operator.

3,668,625

MONITORING SYSTEM

David Wolf, 67 Bracket Road, Newton, Mass., and Edward Blank, 550 Turnpike St., Sharon, Mass.

Filed Sept. 21, 1970, Ser. No. 73,974
Int. Cl. G08g *1/01*
U.S. Cl. 340—38 R **7 Claims**



A monitoring device designed primarily for monitoring movement of automotive vehicles on highways, tunnels, bridges and the like. Cables extend the length of the highway or other route being monitored which are designed to have their characteristic impedance varied by movement of vehicles in adjacent parallel paths. The cables are connected to a pulsing circuit and receiver so that the cables may be pulsed and reflections or partial reflections of the pulsed signals received and displayed on an oscilloscope which is calibrated for an A scope visual display and indication of the highway or route being monitored. The presence of automobiles or the like along the highway cause impedance mismatches on the cables which are reflected and suitably displayed. These impedance mismatches move along the display at a rate consistent with the rate of movement of the vehicles and thereby indicate visually movement or stoppage of traffic. The system is designed to be connected automatically to traffic control signals.

3,668,626

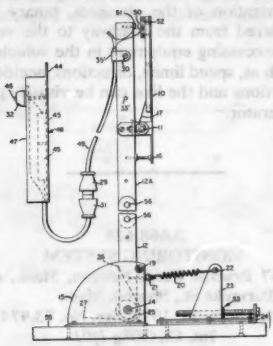
PORTABLE PARKING INDICATOR

Harold W. Follett, 100 Reamer Ave., Wilmington, Del.

Filed Feb. 26, 1971, Ser. No. 119,269
Int. Cl. G08b *21/00*
U.S. Cl. 340—51 **8 Claims**

A portable parking indicator is provided which signals the driver of a vehicle that he has reached a predetermined parking position in a garage or other regularly assigned parking space. The signaling means can be a light bulb, whose source of power can be either a battery or line voltage, which is actuated by the vehicle bumper depressing a contact plate mounted pivotably upright on a vertically adjustable lever

and closing an electrical contact positioned between the contact plate and the lever. The lever is mounted pivotably



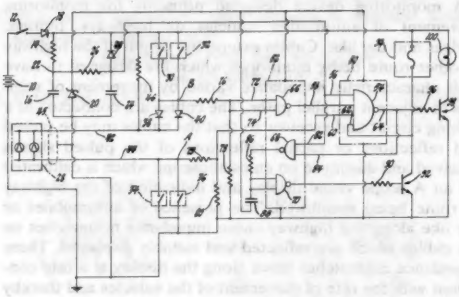
upright on a movable base and is connected to tension means which holds the lever in an upright position.

3,668,627

AIR CUSHION ACTUATION AND MONITORING CIRCUIT

Wendell C. Brainerd, Milwaukee, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 21, 1970, Ser. No. 73,687
Int. Cl. B60g *1/00*; B60r *21/08*
U.S. Cl. 340—52 H **5 Claims**



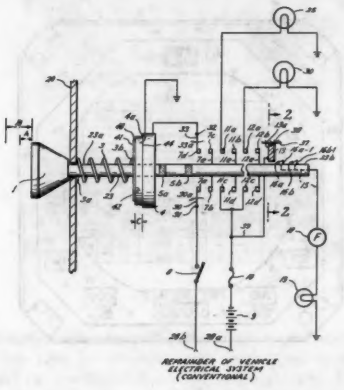
A control circuit for actuating an inflatable air cushion in a motor vehicle includes a series network comprising an electrically operated actuator connected between first and second normally open acceleration responsive switches. The series network is connected across the vehicle battery as well as a storage capacitor to provide redundant sources for operating the actuator upon simultaneous closure of the switches in response to acceleration or deceleration of the vehicle in excess of a predetermined magnitude and duration. A diode is connected between the first switch and the actuator and a resistor is connected across the first switch and the diode to thereby establish a normally relatively high potential at a junction between the actuator and the second switch and to reverse bias the diode and establish a relatively low potential at a junction between the diode and the first switch. Logic circuitry is provided for monitoring the voltage at the two junctions and for energizing indicator means and recording means in the event of a malfunction in the control circuit resulting in the voltages at the two junctions assuming substantially the same value.

3,668,628

MOTOR VEHICLE LIGHTING CONTROL AND EXTINGUISHING SYSTEM

Marvin A. Barrow, Houston, Tex., assignor to Benjamin F. Byerly; Jack C. Watkins; Austin L. Potts and Lloyd Osburn, part interest to each

Filed Sept. 8, 1970, Ser. No. 70,299
Int. Cl. B60q *1/00*
U.S. Cl. 340—52 D **8 Claims**



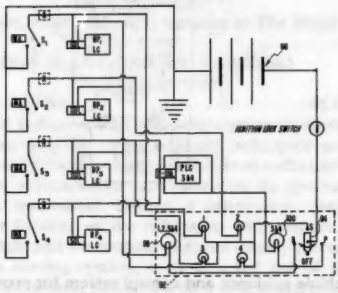
Motor vehicle lighting control system for plural exterior vehicle lights which are selectively operable in accordance with the position of a light operation switch. The system extinguishes the vehicle's lights and returns the light operation switch to its unoperated position by suitable electromagnetic force means upon opening of the vehicle's ignition switch. An override feature allowing use of the lights with the ignition switch open is provided together with circuitry to give an indication that the override feature has been engaged.

3,668,629

VEHICLE ANTI-SKID AND ANTI-SPIN SIGNAL AND CONTROL DEVICE

Walter S. Pawl, 2844 Powder Mill Rd., Adelphi, Md.

Continuation-in-part of application Ser. No. 806,344, Feb. 25, 1969, now Patent No. 3,608,980. This application Mar. 22, 1971, Ser. No. 126,601
Int. Cl. B60q *1/00*; G08b *21/00*
U.S. Cl. 340—53 **13 Claims**



A means for detecting the point at which the braking wheel begins to skid or the driving wheel begins to spin, by using circumferential accelerometers mounted on the wheels to indicate the initiation of a skid or a spin by an inertial dis-

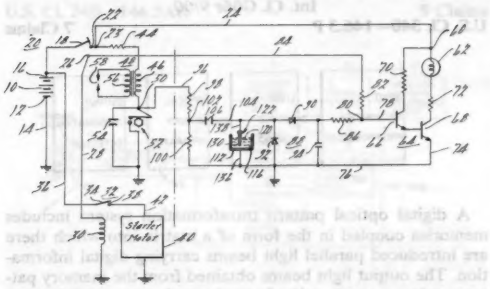
placement of each of the accelerometer weights as it passes the bottom of its rotation as the wheel starts to decelerate or accelerate its rotation faster than the resulting deceleration or acceleration of the vehicle, or is actually locked while the vehicle is still in motion, or is spinning while the vehicle is motionless. This displacement is used to control the means for reducing the maximum brake pressure or the maximum power that may be applied, to a maximum that the instant conditions of load, tire and road characteristics will permit without causing skidding or spinning of the particular wheel on which the accelerometers are mounted. Thus, by having the maximum pressure that may be applied to the brakes on each wheel, separately and automatically limited in this manner to get the maximum braking without skidding, a safe stop can be made even under the most hazardous conditions, in the shortest distance possible. Likewise, by having the maximum power applied, automatically limited in the same manner, to get maximum acceleration, a fast spurt to the desired speed can be safely and most speedily accomplished, even under adverse road conditions.

3,668,630

LOW LIQUID LEVEL INDICATOR

Bernard G. Radin, Oak Park, and Lawrence J. Vanderberg, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 22, 1970, Ser. No. 48,217
Int. Cl. B60q *1/00*; G01f *23/24*
U.S. Cl. 340—59 **4 Claims**



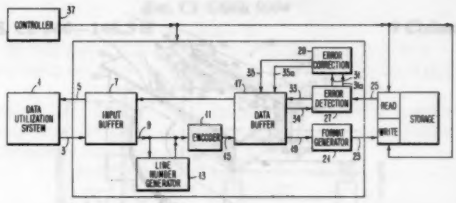
A low liquid level indicator particularly adapted for use in an automotive vehicle which employs the alternating current voltage that appears across the primary winding of the ignition system of the vehicle to energize a probe which is adapted to be immersed in a liquid. A solid state switching network is employed to control the energization of a warning means from a source of direct current electrical energy, for example, the vehicle battery. The probe and the container holding the liquid are connected in shunt with the control electrode of the solid state switching network. When the liquid is at a satisfactory operating level, the probe is effectively immersed in the liquid and the impedance of the circuit comprised of the probe, liquid and container is sufficiently low that the voltage applied to the control electrode of the solid state switching network is insufficient to switch it to a conducting state and thus energize the warning means. If the liquid level falls to an unsatisfactory operating level, however, the impedance of the probe to container circuit is increased markedly thereby increasing the voltage level applied to the control electrode of the solid state switching network. This switches the solid state switching network to a conducting state and energizes the warning means.

3,668,631

ERROR DETECTION AND CORRECTION SYSTEM WITH STATISTICALLY OPTIMIZED DATA RECOVERY

Robert L. Griffith, San Jose, and Ira B. Oldham, III, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1969, Ser. No. 798,975
Int. Cl. G06f *11/00*
U.S. Cl. 340—146.1 AX **17 Claims**



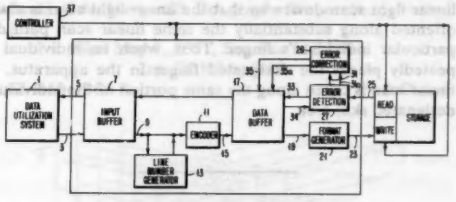
A statistically optimized data recovery apparatus in a system having data storage and retrieval means, said apparatus including error detection means, a plurality of error correction means, first schedulers for scheduling a plurality of error correction attempts, and a second scheduler and a parameter variation means, said second scheduler providing for ordered selection of the first scheduler, and said parameter variation means providing for variation of parameters of said retrieval means, in an attempt to recover data in error.

3,668,632

FAST DECODE CHARACTER ERROR DETECTION AND CORRECTION SYSTEM

Ira B. Oldham, III, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1969, Ser. No. 798,976
Int. Cl. H04l *1/10*
U.S. Cl. 340—146.1 **14 Claims**



Apparatus for detecting and correcting errors in a digital computer storage system is disclosed. Data is encoded using a generalized Reed-Solomon encoder. Error detection circuitry including power sum calculating devices are used for detection of data in error. The error correction portion of the invention includes an improved decoding scheme for determining the location and magnitudes of errors within the data and has a very low average correction time. Means are provided for determining the starting area of a data block in the presence of errors in the starting area. Further means are provided for detecting a cyclic shift in a data character which, under normal conditions, would appear as an acceptable code word even though in error.

3,668,633

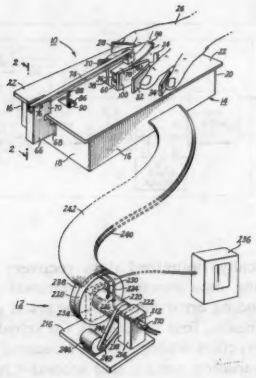
ORIENTATION AND LINEAR SCAN DEVICE FOR USE IN AN APPARATUS FOR INDIVIDUAL RECOGNITION

Charles Sadowsky, Great Neck, N.Y., assignor to Dactylog Company, New York, N.Y.

Continuation-in-part of application Ser. No. 855,955, Sept. 8, 1969. This application Jan. 29, 1970, Ser. No. 6,662

Int. Cl. G06k 9/00

U.S. Cl. 340—146.3 E 15 Claims



An apparatus for positively orienting a designated skin area of an individual to be identified or whose identity is to be verified with respect to a linear light scan device adapted to project a linear light scan along the designated skin area of the individual. Because each individual's skin configuration is unique, the light scan incident on the designated skin area produces a shadow effect which is unique. The incident light is detected by a photocell and transduced into electrical signals representative of, and unique to, a particular individual. These signals may then be compared with a known set of signals to identify the individual or verify the individual's identity. The designated skin area, for example the underside of a selected finger, is positively oriented with respect to the linear light scan device by means of a hand support and floating finger guide which automatically adjusts to an individual's finger size and, as it adjusts, moves the linear light scan device so that the linear light scan is always oriented along substantially the same linear scan path of a particular individual's finger. Thus, when an individual repeatedly places the designated finger in the apparatus, the linear scan is taken along the same portion of the individual's designated skin area.

3,668,634

DYNAMIC THRESHOLD VOLTAGE DETERMINATION SYSTEM

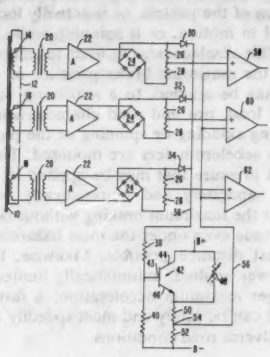
Karlis Kruklitis, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1970, Ser. No. 35,084

Int. Cl. G06k 9/00

U.S. Cl. 340—146.3AG 3 Claims

A dynamic threshold voltage system for neutralizing the unwanted electrical signals caused by intertrack crosstalk as generated in multi-track electromagnetic transducers. The system is responsive to the amplitudes of intelligence bearing electrical signals to generate a direct current voltage threshold level which is a predetermined ratio of the intelligence bearing signal. This threshold level is applied to all of the data channels for the multi-track electromagnetic transducer to effectively neutralize any unwanted crosstalk originated signal appearing on any channel.



3,668,635

DIGITAL OPTICAL PATTERN TRANSFORMATION SYSTEM WITH OPTICAL MEMORIES

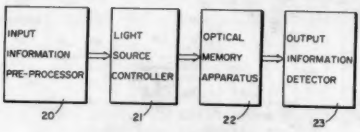
Yasuo Mizobuchi, Yokohama, and Isao Hoshino, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 22, 1970, Ser. No. 48,069

Claims priority, application Japan, June 20, 1969, 44/48325; Aug. 21, 1969, 44/65683; Jan. 16, 1970, 45/3795; 45/3796; June 11, 1970, 45/49860

Int. Cl. G06r 9/00

U.S. Cl. 340—146.3 P 7 Claims



A digital optical pattern transformation system includes memories coupled in the form of a matrix into which there are introduced parallel light beams carrying digital information. The output light beams obtained from the memory pattern under a certain rule of transformation are conducted to an output information detector, to generate a given digital output information therein.

3,668,636

METHOD AND CIRCUIT ARRANGEMENT FOR THE RECOGNITION OF CHARACTERS

Reinhart Blucher, Darmstadt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

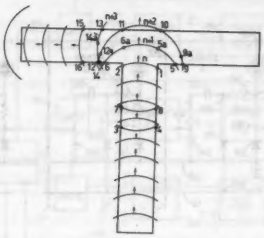
Filed Aug. 5, 1970, Ser. No. 61,341

Int. Cl. G06r 9/16

U.S. Cl. 340—146.3AE 9 Claims

A method of recognition of signs in which a scanning beam, passed circularly across the overall line width of a sign, is caused to follow up the contour of a sign and in which a signal sequence significant of the sign is derived from further circular scanning ramifications, uninterrupted lines and termini of the signs being recognized from the number of black-white transitions per scanning period. The arc determined by the width and phase of the scanning pulse and covering a line last scanned within a scanning cycle is stored and compared with the arcs of the lines covered during the next-following scanning cycle for assessing coincidence. The coinciding arcs are used as recognition criteria so that no

coincidence for one or more scanning cycle indicate a terminus of a sign, one coincidence per scanning cycle indicates the presence of a non-ramified line and a plurality of coincidences per scanning cycle indicate a ramification. The angular value for the direction of follow-up of the scanning circle is derived from the values of beginning and termination of the coinciding arcs.

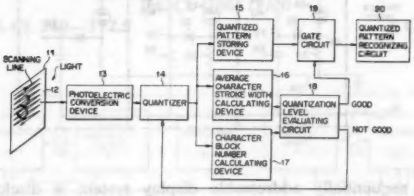


3,668,637

CHARACTER READER HAVING OPTIMUM QUANTIZATION LEVEL

Kunio Sakai, Tokyo; Sumio Katsuragi, Yokohama, and Sadakazu Watanabe, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 14, 1970, Ser. No. 72,095
Claims priority, application Japan, Sept. 16, 1969, 44/72706
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3AG **9 Claims**



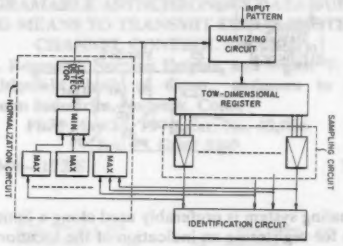
A character reader includes a photoelectric conversion device arranged to optically scan the surface of a record carrier bearing an original character to be read out, the output video signals thereof being supplied to a quantizer for quantizing each of the elemental areas on the surface which form a matrix of rows and columns at a threshold voltage level. The quantized pattern signals from the quantizer, comprised of the binary logical digits "1" and "0," are supplied to a quantized pattern storing device to be temporarily stored therein and also to an average character stroke width calculating device and a character block number calculating device. The calculating devices calculate respectively the average stroke width and block number of the original character on the record carrier from four adjacent contents in the matrix form (corresponding to four adjacent elemental areas) successively supplied from the quantizer. A quantization level evaluating device evaluates the outputs of the calculating devices and adjusts the threshold voltage level at the quantizer until it attains an optimum level. Then, the evaluating device opens a gate circuit coupled to the storing device and supplies through the gate circuit the quantized pattern corresponding to the output signals quantized by the quantizer at the optimum level to a quantized pattern recognition circuit to effect the actual reading of the original character.

3,668,638

PATTERN PROCESSING SYSTEMS

Taizo Iijima, Tokyo; Issei Yamazaki, Urawa; Shunji Mori, Chiba; Hiroshi Genchi, Kawasaki, all of Japan, and Sumio Katsuragi, deceased, late of Tokyo, Japan (by Kaoru Katsuragi, heiress), assignors to Kogyo Gijutsuin, an authority of the Japanese Government, Tokyo-to and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki-shi, Japan, part interest to each

Filed Nov. 2, 1970, Ser. No. 86,145
Claims priority, application Japan, Nov. 5, 1969, 44/88107; 44/88108
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 H **9 Claims**



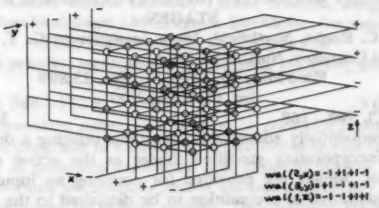
Each input pattern supplied for the purpose of identification is translated through light energy into an electrical signal which is then quantized and stored in a two-dimensional register. The quantized values in the register, consisting of binary digits 0 (representing a white spot) and 1 (a black spot), may be further subjected to a process of a blurring operation and/or that of line width normalization. The pattern blurring operation is effected by means of sampling circuits with their resistances preadjusted at specific values. The latter process is carried out by means of a line width normalization circuit capable of detecting the line width of sampled pattern obtained by the above sampling procedure and of feeding back the results of the detection of the two-dimensional register or the quantizing circuit for the readjustment, if necessary, of the line width into a desired range.

3,668,639

SEQUENCY FILTERS BASED ON WALSH FUNCTIONS FOR SIGNALS WITH THREE SPACE VARIABLES

Henning Friedolf Harmuth, Bethesda, Md., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 7, 1971, Ser. No. 141,328
Int. Cl. H04q *9/00*
U.S. Cl. 340—166 R **3 Claims**

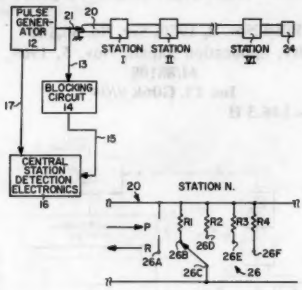


A sequency sampling filter based on Walsh Functions for signals having three space variables, x, y and z. Voltages derived from the space domain are transformed into voltages in a sequency domain. The filtering process is performed by not feeding certain voltages $a\ (k,m,n)$ to a circuit which performs the inverse transformation of voltages in the sequency domain back into the space domain.

3,668,640
SIGNALING AND INDICATING SYSTEM

David M. Driscoll, 86 Exeter St., Walliston, Mass.

Filed Nov. 5, 1970, Ser. No. 87,056
Int. Cl. H04q 9/00
U.S. Cl. 340—167 B 10 Claims



A signaling system is preferably used along a limited access highway for registering an indication of the location of a motorist in distress. A plurality of remote stations may be positioned at fixed intervals along the highway and are connected to a central control station by a coaxial cable. Each such station comprises a switching means including means which when actuated change the impedance of the cable to one of a selected number of different impedances, each such impedance providing for different degrees of reflection of a pulse transmitted from the central station. Means are provided, coupled to the cable and forming part of the central control station, for transmitting electrical pulses at a predetermined repetition rate along the coaxial cable. The central control station also includes detection electronics for storing an indication of both the occurrence of the transmitted pulse and a pulse reflected from one of the remote stations, and means for indicating which of said stations has been actuated by a distressed motorist.

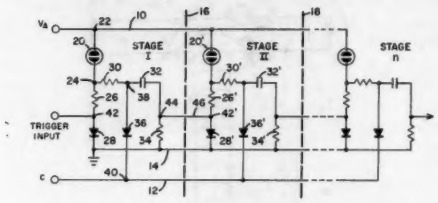
In another embodiment of the invention the detection electronics comprises means for monitoring the plurality of stations and for registering a call (actuation of a switching means at a station) from more than one remote station. In this embodiment, in addition to providing means for indicating which station has called, amplitude detection means in association with logic means may also be provided to determine which of said different impedances have been selected at any one remote station.

3,668,641
DISPLAY APPARATUS HAVING PLURAL GAS DIODE STAGES

John C. Rooks, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Mar. 30, 1970, Ser. No. 23,899
Int. Cl. H04q 3/00
U.S. Cl. 340—168 2 Claims

A sequentially addressable apparatus utilizing a drive circuit incorporating gas-filled diodes as the active element thereof. Means are provided for coupling an input signal representative of a condition to be displayed to the system, with the input signal being coupled to the first stage of the system, and with each succeeding stage being coupled to its own immediately succeeding stage such that signals representing the state of each discrete stage can be propagated from stage to stage. The breakdown of a gas-filled diode in a first stage of a multi-stage display permits current to flow through a path including a capacitor, thereby charging up the capacitor in response to the current flow. The residual charge on the capacitor when added to the voltage applied to the system provides a potential level which exceeds the ignition potential of the gas-filled diode in the second stage, thus causing ignition of the gas-filled diode for the second stage. When the condition being represented is such that the breakdown of the gas-filled diode in the first

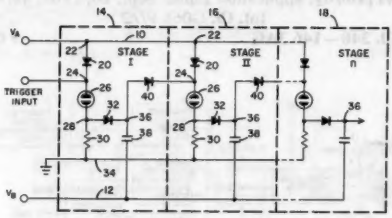


stage is not desired, the system will transfer this condition in a similar fashion. Thus, the system is capable of transferring representative conditions from the first stage to succeeding stages.

3,668,642
SEQUENTIALLY ADDRESSABLE ALPHA-NUMERIC GAS TUBE DISPLAY DEVICE

John C. Rooks, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Mar. 31, 1970, Ser. No. 24,159
Int. Cl. H04g 3/00
U.S. Cl. 340—168 4 Claims



A sequentially addressable display system is disclosed wherein a plurality of stages, each including a series connected combination of a gas-filled diode, such as a neon glow tube, and a capacitor are coupled between a pair of voltage buses. Means are provided for coupling an input signal representative of a condition to the first stage of the system, with each succeeding state being coupled to its own immediately succeeding stage such that signals representing the state of each discrete stage can be propagated from stage to stage through the system, thus providing a transfer from the first stage to succeeding stages. A condition represented by an extinguished glow tube may also be propagated from stage to stage through the display system.

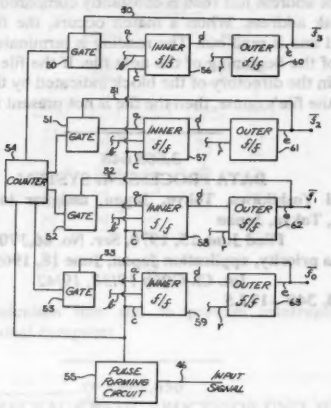
3,668,643
DATA TRANSMISSION SYSTEM

Lloyd M. Germain, Los Angeles, Calif., assignor to Data Instruments Company, Sepulveda, Calif.

Filed Aug. 14, 1970, Ser. No. 63,721
Int. Cl. H04q 9/00
U.S. Cl. 340—171 R 15 Claims

A data transmission system which utilized a plurality of predetermined frequencies to transmit data is disclosed. The system is particularly useful for synchronous data transmission for example where a change from one predetermined frequency to another is utilized to code binary or trinary data. A plurality of gating signals, each separated by a finite

time are generated and used to detect the presence of the predetermined frequencies. The coincidence of pulses representative of the period of the transmitted frequency and the gating signal associated with the transmitted frequency is



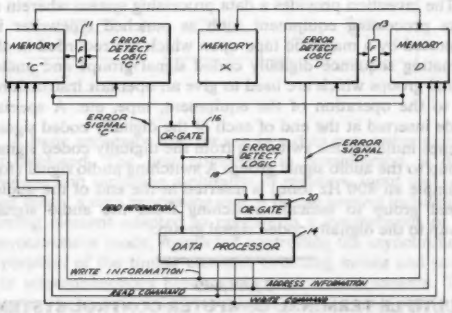
detected and utilized to identify the transmitted frequency. The predetermined frequencies and gate durations are selected so as to allow the jitter associated with transmitted frequency to go undetected.

3,668,644

FAILSAFE MEMORY SYSTEM

Floyd W. Looschen, Arcadia, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 9, 1970, Ser. No. 9,817
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **8 Claims**



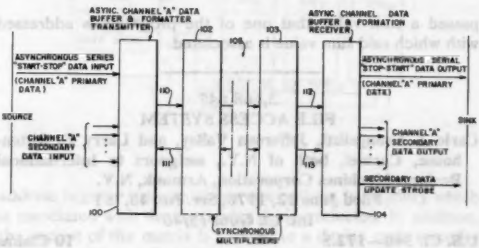
A memory system comprising a plurality of memories containing identical information stored at corresponding addresses. Information is requested simultaneously from the memories by a data processor. The requested information is simultaneously supplied to the inputs of a first OR-gate which operates to pass such requested information when it is supplied thereto from any or all of the memories. A plurality of first error detection means are associated with each memory, each operating to disable its associated memory from supplying requested information to the data processor when it detects an error in the information at the memory output, and each operating to send an error signal to the data processor informing it that an error has been detected. Second error detection means are associated with the first OR-gate for detecting an error in the information at its output being sent to the data processor. A second OR-gate couples error signals to the data processor in a manner that a signal, indicating that an error has been detected somewhere in the system, will be supplied to the data processor upon receipt, by the second OR-gate, of an error signal from any or all of the first and second error detection means. Responsive to its receipt of such signal, the data processor is programmed to re-request the originally requested information simultaneously from the memories. Any disabled memory does not respond to such re-request until repaired, updated with information from the other memories, and re-enabled into the system.

3,668,645

PROGRAMABLE ASYNCHRONOUS DATA BUFFER HAVING MEANS TO TRANSMIT ERROR PROTECTED CHANNEL CONTROL SIGNALS

Welles K. Reymond, Noroton Heights, and Walter V. Ciecierski, Ridgefield, both of Conn., assignors to General Datacomm Industries, Norwalk, Conn.

Filed May 25, 1970, Ser. No. 40,006
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **7 Claims**


ASYNC. CHANNEL "A" DATA BUFFER & FORMATTER TRANSMITTER
ASYNC. CHANNEL DATA BUFFER & FORMATION RECEIVER
ASYNCHRONOUS SERIES "START-STOP" DATA INPUT (CHANNEL "A" PRIMARY DATA)
ASYNCHRONOUS SERIAL "STOP-START" DATA OUTPUT (CHANNEL "A" PRIMARY DATA)
SOURCE
SINK
CHANNEL "A" SECONDARY DATA INPUT
CHANNEL "A" SECONDARY DATA OUTPUT
SECONDARY DATA UPDATE STROBE
SYNCHRONOUS MULTIPLEXERS

Programable transmitting and receiving data buffers and formatters are provided which accept start-stop data that is formatted by removing the start-stop pulses and coded for transmission with a primary data indicator bit. Secondary channel control data with an identifying indicator bit is automatically inserted in the transmission time slot when primary data is not available. A method and means are provided for separating primary data from secondary control data at the receiver and delivering error protected control signals.

3,668,646

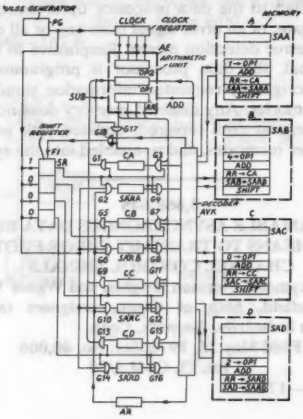
METHOD OF CONTROLLING JUMPS TO DIFFERENT PROGRAMS IN A COMPUTER WORKING IN REAL TIME

Goran Anders Henrik Hemdal, Tyreso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed June 10, 1970, Ser. No. 45,110
Claims priority, application Sweden, June 17, 1969, 8586/69
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **3 Claims**

The invention refers to a method of controlling jumps to different programs in a computer which works in real time. A number of programs associated with different priority levels are performed sequentially within subsequent primary intervals determined by a clock register. The programs associated with the different priority levels have to be addressed in periodically recurrent intervals of different length. After having performed a program a sum value is formed by addition of the contents of the clock register and a number corresponding to the number of subsequent primary intervals within which the addressing of the program has to be omitted. Within each primary interval the actual value of the clock register in priority order is compared with the sum

values associated with the respective programs. If the value of the clock register upon comparison is found to have



passed a sum value that one of the programs is addressed with which said sum value is associated.

3,668,647

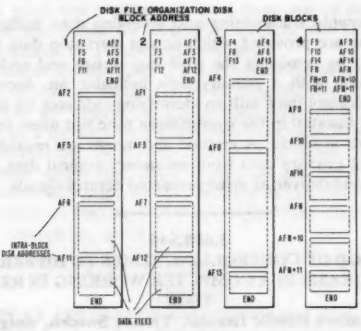
FILE ACCESS SYSTEM

Carlo J. Evangelisti, Jefferson Valley, and Larry E. Rittenhouse, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 12, 1970, Ser. No. 45,751

Int. Cl. G06f *15/40*

U.S. Cl. 340—172.5 **10 Claims**



A system is shown wherein, provided with an appropriate file organization, a data file can be read from a disk master file, given the file name, by performing one seek and one read operation. The system employs hash coding to compress a data file name to a disk file address. The disk file is positioned into fixed length blocks where each hashed file address points to a block, the block being as large as one cylinder or as small as one sector. Each block is organized such that it includes a directory for the files contained in the block and also contains the data files. Each entry in the directory contains the data file name and the address of that data file in the block. The process of locating and reading a data file entails the hash coding of a file name to yield a block address, the moving of the read head to the disk area having the block address and the reading of the directory and the remainder of the block to read out the data file. In the directory reading, the data file names are compared in real time, as they are read from the disk, with the name of the desired data file. When a name match occurs, the address of the data file in the block and the address of the next file address are read and stored. As the disk rotates, the desired data file address just read is constantly compared with the active disk address. When a match occurs, the file has been located and is read out. The reading is terminated at the address of the beginning of the next file. If the file name is not found in the directory of the block indicated by the hash coding of the file's name, then the file is not present therein.

3,668,648

DATA PROCESSING SYSTEM

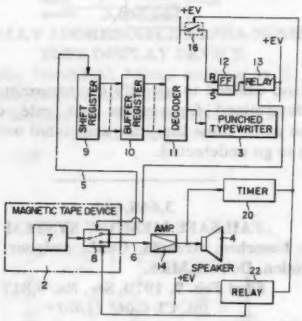
Kinichi Yoshikawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,370

Claims priority, application Japan, June 18, 1969, 44/47627

Int. Cl. G05b *19/38, 19/42*

U.S. Cl. 340—172.5 **4 Claims**



The invention provides a data processing system wherein a data processing equipment such as punched typewriter is operated by a magnetic tape upon which are recorded in alternating sequence digitally coded signal groups and audio signal groups which are used to give an operator instructions as to the operation of the equipment, tape, etc. A special code inserted at the end of each of the digitally coded signal groups indicates the switching from the digitally coded signal group to the audio signal group. A switching audio signal (for example an 800 Hz tone) is inserted at the end of the audio signal group to indicate switching from the audio signal group to the digitally coded signal group.

3,668,649

MULTIPLE TERMINAL COMPUTER CONTROL SYSTEM FOR GROUP POLLING

John H. Pedersen, Brussels, Belgium, and Michael J. Bedford, Northville, Mich., assignors to Burroughs Corporation, Detroit, Mich.

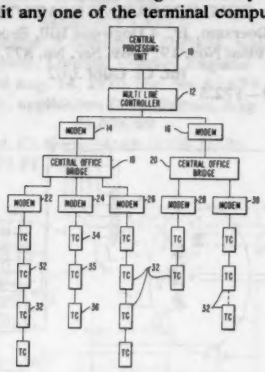
Filed June 26, 1970, Ser. No. 50,251

Int. Cl. G06f *3/04*; H04l *5/00*

U.S. Cl. 340—172.5 **5 Claims**

A control system for permitting each one of a plurality of transmit ready terminal computers to reply to a single polling command from a central processor. In an environment wherein a plurality of remote-terminal computers are concatenated to a single modem, a single polling command from the central processor will permit all of the transmit ready terminal computers to transmit data information to the central processing unit. Each terminal computer, being individually controlled through its program, will periodically contend for

the communication channel. Logic circuitry is disclosed herein to permit any one of the terminal computers to seize



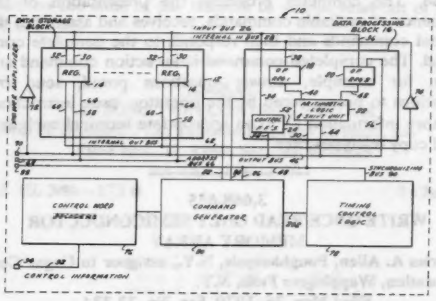
the communication line and to prevent interruption by another terminal computer.

3,668,650

SINGLE PACKAGE BASIC PROCESSOR UNIT WITH SYNCHRONOUS AND ASYNCHRONOUS TIMING CONTROL

Fuh-Lin Wang, Wappinger Falls, N.Y., assignor to Contrologic, Inc., New York, N.Y.

Filed July 23, 1970, Ser. No. 57,586
Int. Cl. G06f *13/00, 15/16*
U.S. Cl. 340—172.5 **15 Claims**



A basic processor unit for use in a data processing system is disclosed. The unit comprises in combination, a data storage unit including a plurality of registers, input and output buses, a data processing unit, a timing control including a timing element adapted to operate in a synchronous or an asynchronous mode, means for controlling the asynchronous operation of the timing element, decoding means and suitable interconnections between the various components. The present processor unit is so designed as to enable it to be connected to another similar unit, in series and/or in parallel whereby to increase either the number of bits per facility or the number of facilities or both. An improved data processing system utilizing the present processor is also disclosed.

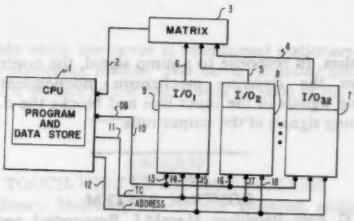
3,668,651

WORKING DEVICE CODE METHOD OF I/O CONTROL

Louis Michael Hornung, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,685
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **13 Claims**

A technique of I/O control in which each of the devices in the system has a unique actual device code which is used during an input and output instruction execution. The I/O instruction instead of containing the actual code of the device will contain a working device code. For purposes of illustration in a thirty-two device system, a three-bit working device code is used instead of the five bit actual device code. During execution of an I/O instruction the three-bit working device code is used to address a portion of memory in which the actual device codes are stored. The actual device code associated with the working device code is then output both to a decoder to cause selection of an associated input/output address register and along the device code buss to the I/O devices. A comparison is made between the local actual device code wired into each I/O device and the transmitted code to determine which I/O device has been selected. The function to be performed as defined by the I/O instruction is stored in the selected I/O device. During subsequent interrupts each I/O device will activate its own interrupt line and a matrix is employed to determine which of the I/O devices simultaneously requesting service is of highest priority. The output of the matrix is then used to address the input/output



address register store to obtain the address in memory which is associated with the particular device selected. In addition, the output of the matrix is applied to a device code encoder which provides a five-bit device code to the device code buss. This code is broadcast to the I/O devices so that the devices can determine by means of a comparison of the transmitted device code with its local stored device code, which device is to be interrupt serviced.

Overlap operation of all thirty-two I/O devices can be accomplished through use of the working device code technique under control of the supervisory program which selectively loads different actual device codes into the actual device code store in a manner such that for one operation a working device code will be associated with a first I/O device and during subsequent operations be associated with different I/O devices in accordance with the actual device code stored in the actual device code store by the supervisory program. Program sharing can thus be accomplished by switching of actual device codes associated with a given working device code in the actual device code store.

3,668,652

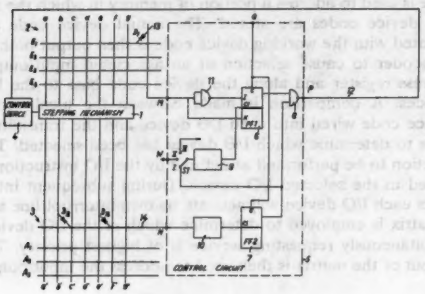
APPARATUS FOR CONTROLLING JUMPING OPERATIONS FOR A PROGRAM CONTROL EQUIPPED WITH STEPPING MECHANISM

Ulrich Zahn, Aargau, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Feb. 11, 1971, Ser. No. 114,573
Claims priority, application Switzerland, Apr. 2, 1970, 4924/70
Int. Cl. G06f *9/00*
U.S. Cl. 340—172.5 **18 Claims**

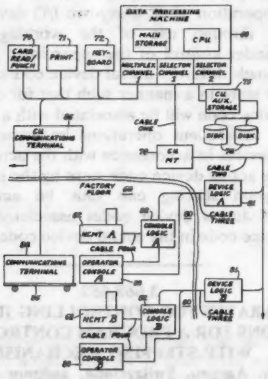
There is disclosed an apparatus for controlling the jump operations of a program control which is generally manifested by the features that, there is provided a control circuit which can be optionally connected at any one of the output lines of a stepping mechanism and controlled by the signal of the output line, this control circuit serving for generating the jump or stepping signals for the switching

stages of the switching mechanism which are to be momentarily jumped. This control circuit is coupled with the input side of an electrical control device for the stepping



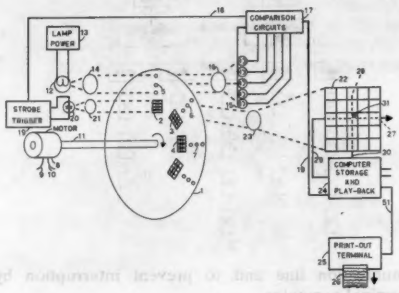
mechanism. In response to a jump signal, the control device advances the stepping mechanism independent of the switching signals of the input line and blocks the delivery of positioning signals at the output rails.

3,668,653
CONTROL SYSTEM
Donald G. Fair, Belvidere; Harold L. Baeverstad, and William G. Fisher, both of Rockford, all of Ill., assignors to Sundstrad Corporation
Continuation-in-part of application Ser. No. 706,365, Feb. 19, 1968, now abandoned. This application Oct. 22, 1968, Ser. No. 769,500
Int. Cl. G05b 15/02; G06f 15/02, 15/20
U.S. Cl. 340—172.5 **95 Claims**



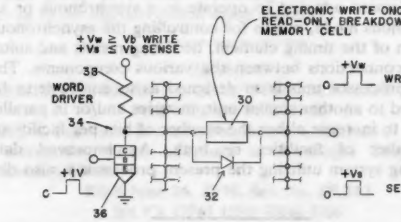
An on-line data processing machine controls the operation of one or more machine tools. A general purpose communications link allows each machine tool and/or the operator therefore to communicate with the data processing machine and either change the operations which the machine tool would otherwise perform under control of an existing stored program, or add new or partly new operations, which if desired can thereafter immediately be performed by the machine tool.

3,668,654
COMMUNICATING COMPUTER
Charles H. Doersam, Jr., 4 Dogwood Hill, Brookville, N.Y.
Filed Nov. 19, 1969, Ser. No. 877,995
Int. Cl. G06f 3/02
U.S. Cl. 340—172.5 **10 Claims**



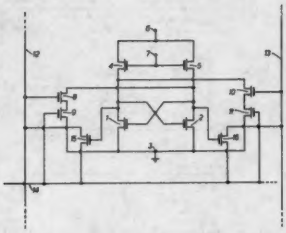
A computer containing stored programs and stored information is programmed by selecting a series of partial commands finally assembled into a complete command. Instead of selecting commands from a great plurality of commands, one from each of a relatively few possible partial commands is selected in sequence to form the complete command. Frames carrying a sequence of these few commands are projected on a touch sensitive selection screen and selection is performed by the operator simply by touching one of the touch sensitive panels corresponding to the selected command. The computer programs the presentation of the sequence of available commands, receives and assembles the partial commands and then responds to the complete command. The completed command is an action command and may, for example, answer questions posed, send out questions to be answered by the operator, issue instructions or store information all to an appropriate terminal such as a hard copy teletypewriter.

3,668,655
WRITE ONCE/READ ONLY SEMICONDUCTOR MEMORY ARRAY
Charles A. Allen, Poughkeepsie, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.
Filed Mar. 26, 1970, Ser. No. 23,234
Int. Cl. G06f 13/00
U.S. Cl. 340—173 SP **2 Claims**



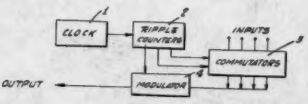
This disclosure relates to a write once/read only semiconductor memory array which utilizes a single voltage (above the memory cell breakdown voltage) on a word drive line to effect writing into any selected memory cell of the array. Each memory cell of the array is preferably provided with a protective diode connected in parallel to the cell to prevent breakdown of unselected memory cells.

3,668,656
MEMORY CELLS
Clive William Hoggar, Chelmsford, England, assignor to The Marconi Company, Limited, London, England
Filed Aug. 14, 1970, Ser. No. 63,679
Claims priority, application Great Britain, Aug. 18, 1969, 41,076/69
Int. Cl. G11c *11/40*; H03k *3/286*
U.S. Cl. 340—173 FF 12 Claims



An electronic memory cell consists of a bistable circuit and three access paths. Two of the access paths are used to control the state of the bistable, one of these paths being used to set the bistable, to one of its two stable states and the other of these access paths to set the bistable to the other stable state. A low impedance path is provided between one of these two access paths and the third access path in dependence on the state of the bistable to permit read-out of the memory cell.

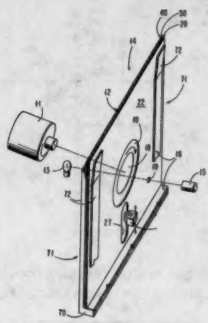
3,668,657
AUTOMATION CONTROL SYSTEM
Edwin R. Deloach, 7733 Dorsette Dr., New Orleans, La.
Filed Nov. 21, 1969, Ser. No. 878,625
Int. Cl. G11c *11/00*
U.S. Cl. 340—173 R 9 Claims



A pulse sampling multiplex system with analog capabilities including a modulating means necessary for direct recording on magnetic tape, an analog DC output, a direct DC output, an AC power output and a servomotor control output, a means for revising information on any channel without altering data on other channels, a "memory" means whereby information can be retained in the system after input data has been discontinued and a means for controlling direct DC and AC power output by punched tape or other parallel digital input means.

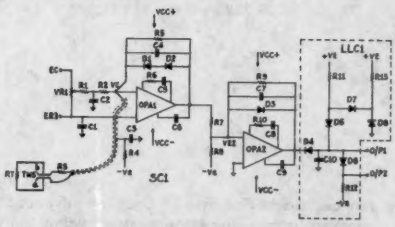
3,668,658
MAGNETIC RECORD DISK COVER
Ralph Flores, San Jose, and Herbert E. Thompson, Santa Clara, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1969, Ser. No. 887,017
Int. Cl. G11b *5/82, 23/02, 25/04*
U.S. Cl. 340—174.1 C 7 Claims

In a magnetic recording system, the combination comprising a rotary magnetic record disk and a cover for containing the disk. The cover has its inner surfaces in frictional contact with the adjacent surfaces of the disk. Furthermore, the disk



is rotatable while the cover is maintained stationary in the magnetic recording system. The cover includes means for cleaning the surface of the disk during rotation of the disk.

3,668,659
TOUCH-WIRE DETECTION SYSTEMS
Leonard Henry Hutchings, Liverpool, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland
Filed Dec. 10, 1970, Ser. No. 96,845
Claims priority, application Great Britain, Dec. 12, 1969, 60,684/69
Int. Cl. G08c *1/00*
U.S. Cl. 340—365 5 Claims

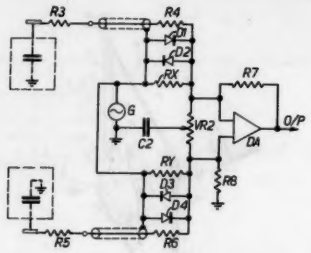


Each touch-wire consists of a pair of contacts and touch is sensed in an operational amplifier by detecting the effect of the direct current change resulting from placing a human finger across the contacts, the contacts having a potential difference between them. The operational amplifier, connected in a current summation mode, is used to produce a voltage change as a function of the change in current at the summation point. The voltage change is amplified by the operational amplifier before being applied to a logic-level clamp.

3,668,660
TOUCH WIRE DISPLAYS
Laurence Ernest Watten, Langley, England, assignor to Plessey Handel Und Investments AG, Zug, Switzerland
Filed Dec. 16, 1970, Ser. No. 98,799
Int. Cl. H03k *13/00*
U.S. Cl. 340—365 2 Claims

Each touch-wire contact is connected, by a screened cable in series with a resistor and a 150 K Hz sine wave produced by the generator. A field-effect transistor detection circuit is connected across the resistor. The transistor is not provided with bias and is thus normally cut-off. When a human finger touches the touch-wire contact an a.c. waveform is applied to

the base of the transistor causing it to conduct. An important feature of the circuit is the connection of the screen of the



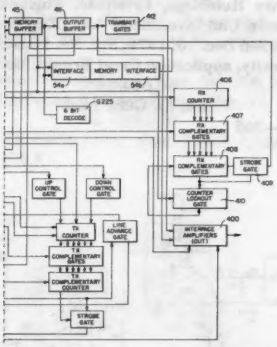
screened lead to the generator thereby preventing the cable capacitance from shunting the touch mechanism.

3,668,661

CHARACTER CODING, MEMORY, AND DISPLAY SYSTEM

Duncan E. Cull, and Alvin E. Culbertson, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed June 25, 1969, Ser. No. 836,270
Int. Cl. G06f *13/02*
U.S. Cl. 340—172.5 **8 Claims**



Characters each identified by a bit code are advanced serially to a memory comprising continuously cycling shift registers, one for each bit of the code. The bits for each character enter the shift registers in parallel. The character codes are placed one behind the other in the shift register memory by operation of a character counter and a second counter which is its complement.

The memory is formatted for control of a cathode ray tube display operating to legibly display all characters in the memory. A major raster traces lines of character positions. A minor raster traces each character in a dot matrix at each character position.

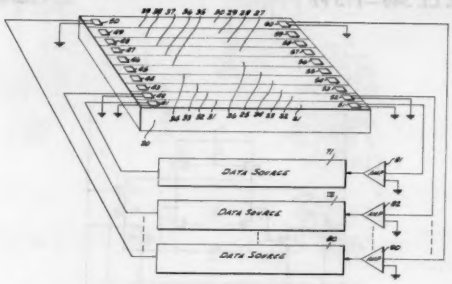
3,668,662

ACOUSTIC DELAY LINE MEMORY SYSTEM

Robert L. Zimmerman, Northridge; Bernard P. Schweitzer, Los Angeles; Hugh L. Garvin, Malibu; Melvin E. Pedinoff, Canoga Park, and Michael Waldner, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 20, 1970, Ser. No. 82,229
Int. Cl. G11c *21/00*
U.S. Cl. 340—173 RC **19 Claims**

An information storage system utilizing an acoustic medium having its surface subdivided into a plurality of individually isolated acoustic transmission channels upon which a plurality of transmit and receive transducers are selectively placed. Each respective transmit transducer is electrically excited by a signal containing information from at least a preselected one of a plurality of data sources in order to cause a resultant acoustic stress wave to be propagated upon the surface of the medium within the associated



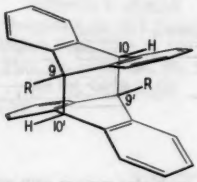
acoustic transmission channel until the resultant stress wave is converted by an associated receive transducer into a plurality of charges which, in turn, are applied to a data source which, on command, either selects a new data to be stored or the old data that was circulated to be reconstituted into a transmit format to be recirculated within the associated acoustic transmission channel of the system.

3,668,663

OPTICAL STORAGE DEVICES

Edwin Arthur Chandross, Murray Hill; Richard Lynn Fork, Holmdel; Angelo Anthony Lamola, Warren, and Walter John Tomlinson, III, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1970, Ser. No. 92,430
Int. Cl. G11c *11/42*, *13/04*
U.S. Cl. 340—173 LS **14 Claims**



A new class of optical, switching and memory devices is based on the different refractive indices associated with each of the two states of the reversible photochemical interconversion between dimer and monomer states in a broad class of organic materials. Reversibility is expedited by use of a rigid medium. The active material may be a solution or suspension of the photosensitive species in a transparent matrix or may be a single-crystal form of the photosensitive material itself.

The particular chemical systems upon which operation is based are so chosen as to result in a relatively large spacing between absorption peaks associated with each of the two states. This class, in which change of state results in a significant change in the resonant character of the material, is further characterized by strong absorption bands (resulting in reasonably complete reaction), by ready reversibility, by thermal stability in either state at usual ambient temperatures, and by refractive index changes within the visible spectrum which are of sufficient magnitude for holographic and other switching or memory use.

3,668,664

MAGNETIC CORE MEMORY PLANE

Seihin Kobayashi, and Michihiro Torii, both of Shizuoka, Japan, assignors to Fuji Denki Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1970, Ser. No. 82,465
Claims priority, application Japan, Oct. 27, 1969, 44/102342
Int. Cl. G11c 5/04, 11/06
U.S. Cl. 340—174 MA 6 Claims

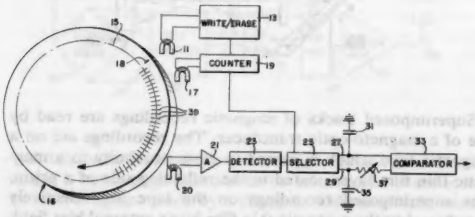
A magnetic core memory plane is provided in which magnetic cores arranged in matrix are strung by a plurality of turns of drive windings. Each drive winding is (1) strung through the magnetic cores in an alignment, (2) turned back along an optically transparent plate superposed upon the cores, and (3) again strung through the same cores to form the plurality of turns of the winding. Both ends of each drive winding are connected to terminal plates provided at the top surface of a frame.

3,668,665

APPARATUS FOR ENSURING TIMING TRACK ACCURACY

Robert J. Reynolds, Ann Arbor, and Virgillo J. Quiogue, Northville, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 30, 1970, Ser. No. 33,365
Int. Cl. G11b 27/12
U.S. Cl. 340—174.1 A 10 Claims



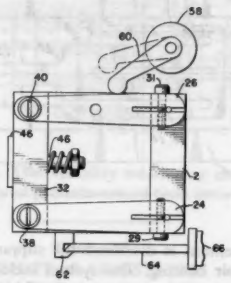
A method and apparatus for precisely checking the accuracy of the placing of timing track marks or bits on the periphery of a rotating recording member, such as a magnetic disc or drum, where the spaces between all the timing track marks or bits must be exactly equal and the variations in spacing, if any, cannot be electronically measured. The timing track bits or marks are written during one revolution of the disc or drum and then read back and used as one input to a comparator. The timing track is erased and then the timing track bits are written during two successive resolutions of the disc or drum and read back as the other input to the comparator. If the amplitudes of the two inputs to the comparator are equal then the writing during the second of the two successive revolutions was directly on top of the writing during the first of the two successive revolutions and all the bit spaces are equal.

3,668,666

FLYING HEAD ON PANTOGRAPH ASSEMBLY WITH PRESSURE RESPONSIVE WITHDRAWAL

Hubert John Heffernan, 316 Forrest Drive, Falls Church, Va., and Charles L. Fontana, 22 Silverspruce Rd., Levittown, Pa.

Filed Apr. 11, 1969, Ser. No. 815,350
Int. Cl. G11b 5/60, 21/12, 21/20
U.S. Cl. 340—174.1 E 11 Claims



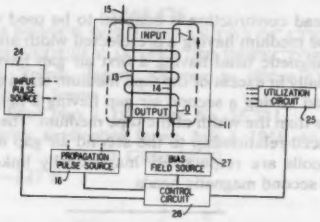
A flying transducer head mounting for use with rapidly moving magnetic data storage devices such as drums of discs having a magnetizable surface is disclosed. The disclosed mounting is a pantograph type support for supporting a multiple transducer head pad on which the transducer heads are mounted. The heads are brought into flying position after the data storage device has reached its operating speed. The entire assembly includes circuit means for bringing the heads into flying position and circuitry to provide fail-safe operation.

3,668,667

MULTILEVEL DOMAIN PROPAGATION ARRANGEMENT

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 30, 1970, Ser. No. 76,823
Int. Cl. G11c 19/00, 11/14
U.S. Cl. 340—174 TF 9 Claims



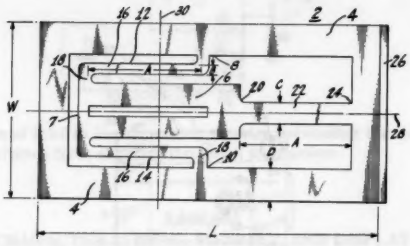
A multilevel coding arrangement for a multistage single wall domain propagation channel is provided by a number of parallel magnetically soft rails adjacent a sheet in which single wall domains can be moved. The rails define laterally displaced stable positions for the domains, n rails defining $n+2$ domain positions in each stage in the domain channel.

3,668,668

TRANSDUCING HEAD MOUNT APPARATUS

George Conrad Robitschek, Los Angeles, Calif., assignor to RCA Corporation

Filed Dec. 7, 1970, Ser. No. 95,778
Int. Cl. G11b 5/60
U.S. Cl. 340—174.1 E 5 Claims



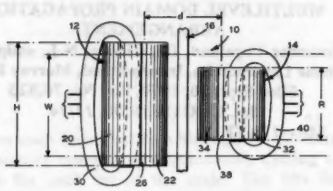
An arrangement is disclosed for supporting a transducer head on an air bearing. The system includes a planar three point resilient suspension system. The suspension system when acted upon by the air bearing deflects to form a parallelogram support for the transducer which provides desired mobility of the transducer.

3,668,669

MAGNETIC HEAD WITH WRITE GAP WIDER THAN TAPE AND READ GAP NARROWER THAN TAPE

Francis C. Marino, Huntington, and Edgar Wolf, New Hyde Park, both of N.Y., assignors to Digitronics Corporation, Albertson, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,659
Int. Cl. G11b 5/26, 5/44
U.S. Cl. 340—174.1 F 11 Claims



The head construction is adapted to be used with a magnetic tape medium having a preselected width and comprises a first magnetic head having a first air gap having a height substantially in excess of the tape medium and a second magnetic head having a second air gap having a height substantially less than the width of the tape medium. The first air gap is in spaced relationship to the second air gap and first and second coils are respectively magnetically linked with the first and second magnetic heads.

3,668,670

METHODS AND MEANS FOR RECORDING AND READING MAGNETIC IMPRINTS

Robert D. Andersen, 1014 S. Hillborn, West Covina, Calif.

Filed Oct. 27, 1969, Ser. No. 869,500
Int. Cl. G11b 5/38
U.S. Cl. 340—174.1 F 6 Claims

A method of recording and then reading magnetic imprints in any of the several magnetizable areas of a magnetic storage surface by the steps of inducing magnetism in selected ones of those areas and then detecting the presence of a magnetic field at those areas by detecting in which of a number of Hall effect devices associated with those areas respectively the Hall effect is exhibited. Also disclosed are in-

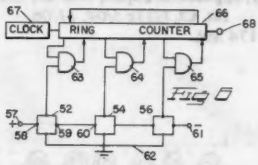


Fig. 5

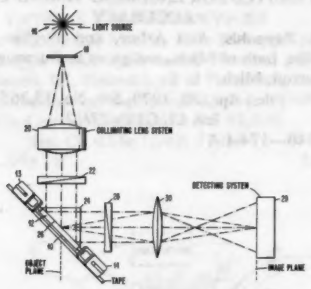
line and matrix magnetic readers employing Hall effect devices, and a unitary Hall effect reader and differential amplifier assembly, and a printer employing only a grid of conductors deposited on a substrate so that the conductors are in close proximity at the crossover points.

3,668,671

METHOD AND APPARATUS FOR READING SUPERIMPOSED MAGNETIC RECORDINGS

Larry H. Everett, Boulder, Colo., and Jack H. Judy, Minneapolis, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1969, Ser. No. 884,880
Int. Cl. G11b 7/28, 11/10
U.S. Cl. 340—174.1 M 4 Claims



Superimposed tracks of magnetic recordings are read by use of a magneto-optic transducer. The recordings are on a magnetic tape which is passed in close proximity to a magnetic thin film layer coated to the reflecting side of a prism. The superimposed recordings on the tape are selectively transferred to the magnetic thin film by an external bias field. The bias field may be selectively energized or selectively positioned to enhance the transfer of one of the plurality of magnetic recordings to the magnetic thin film. The magnetic recording whose transfer is enhanced is the only recording which will be read by use of the magneto-optic effect.

3,668,672

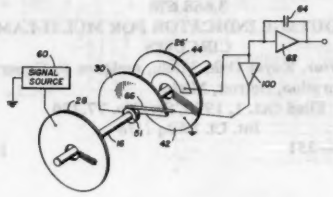
CAPACITIVE TRANSDUCER

James A. Parnell, Houston, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of application Ser. No. 688,500, Dec. 6, 1967, now abandoned. This application Nov. 13, 1970, Ser. No. 89,514
Int. Cl. G08c 19/10
U.S. Cl. 340—200 12 Claims

A variable capacitance displacement transducer is disclosed for developing an electrical signal having an amplitude

precisely controlled by the position of a mechanical input element, which in turn varies the capacitance of the transducer. The transducer includes three spaced conductive places arranged in parallel relation. Electrical signals are applied to one of the outer plates. The other two plates are maintained at substantially the same signal level for minimizing the capacitance therebetween so that the center plate functions as a shield to control the capacitive coupling between the two outer plates. An amplifier including a negative feedback circuit is coupled to the other outer plate to develop output signals having amplitudes determined by relative position between the inner plate and the two outer plates.



3,668,673

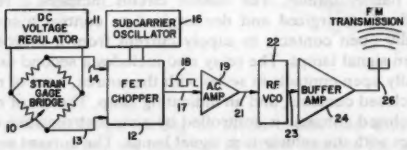
APPARATUS FOR TELEMETERING D.C. SIGNALS

Alan J. Adler, Palo Alto, Calif., assignor to Aerotherm Corporation, Palo Alto, Calif.

Filed Sept. 23, 1970, Ser. No. 74,641

Int. Cl. G08c *19/16*

U.S. Cl. 340—208 **5 Claims**



A telemetry transmitter where a d.c. voltage from for example a strain gage which is to be telemetered is converted to an a.c. square wave by a chopper. This amplitude modulated signal drives a voltage controlled oscillator which produces a frequency modulated signal which is then transmitted to a receiver by an antenna or wire.

3,668,674

METHOD AND ARRANGEMENT FOR TESTING OF VISIBILITY MEASURING ARRANGEMENTS

Werner Westendorf, Hamburg-Grossflottbek, Germany, assignor to Impulsphysik GmbH, Hamburg, Germany

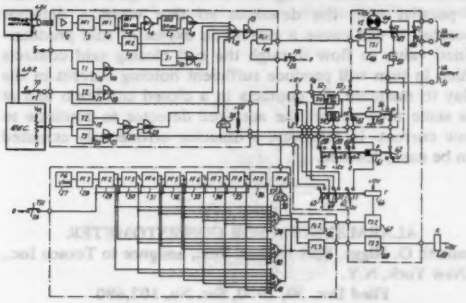
Filed Jan. 30, 1970, Ser. No. 7,155

Claims priority, application Germany, Feb. 1, 1969, P 19 05 016.9

Int. Cl. G08b *29/00*

U.S. Cl. 340—214 **17 Claims**

A normal light input of a visibility meter is blocked and a light guide transmits light directly from the transmitter to the receiver. If the signal generated in the receiver as a function of the received test light is outside a given range, a failure alarm is generated. Proper operation of the visibility alarm relay, the supply voltage source, and the light flash generator are also furnished. The visibility measuring arrangement is tested automatically at predetermined time intervals.



3,668,675

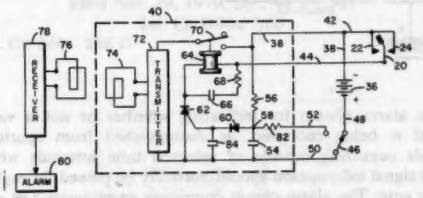
REMOTE ALARM SYSTEM

Allan D. Joens, 8115 Clinton Ave., Minneapolis, Minn.; Robert W. Johnson, 5452 Nokomis Ave., Minneapolis, Minn., and Michael Riggle, 1232 Oakmont Dr., Temperance, Mich.

Filed Apr. 3, 1970, Ser. No. 25,330

Int. Cl. H04b *7/00;* **G08b** *13/00;* **B60r** *25/10*

U.S. Cl. 340—224 **9 Claims**



A vehicle alarm system is disclosed which incorporates an acceleration-sensitive pendulum connected to a relay operated radio transmitter so as to signal silently to a remote station any movement of the vehicle on which the apparatus is magnetically mounted. A charge storage circuit in parallel with the relay keeps the transmitter on for about a 1 second interval.

3,668,676

ALARM DEVICE WITH MEANS TO LOCATE AN ERRONEOUSLY ACTIVATED DETECTOR

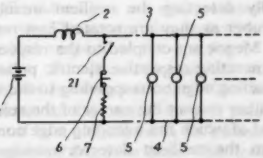
Koju Sasaki, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed May 7, 1970, Ser. No. 35,331

Claims priority, application Japan, July 1, 1969, 44/61795

Int. Cl. G08b *19/00*

U.S. Cl. 340—227 R **1 Claim**



An alarm device for the detection of smoke, fire, and the like having a plurality of detectors connected in parallel and

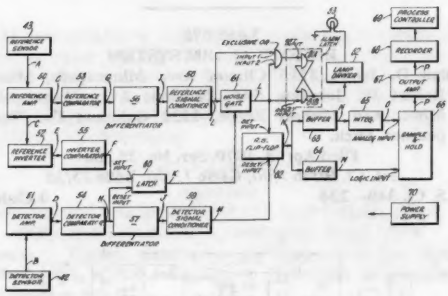
energized by a power supply with the coil of a relay in series with the power supply. Relay contacts are arranged to close when the current through the relay exceeds a predetermined value, said contacts being connected through a resistor and in parallel with the detectors so that when a detector operates, it will cause a current in excess of said predetermined value to flow through the coil closing said contacts which in turn will produce sufficient holding current in the relay to maintain the contacts in a closed condition and at the same time permit the actuated detector to continue to draw current. In this way, a detector erroneously actuated can be easily located.

3,668,677

ALARM SYSTEM FOR CONSISTOMETER

Kenneth O. Higgs, Port Neches, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,690
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 **11 Claims**



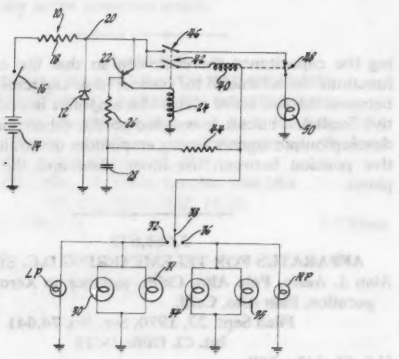
An alarm system for indicating whether or not a valid signal is being recorded, as distinguished from spurious signals occurring outside of selected time intervals when valid signal information should normally be passed through a noise gate. The alarm circuit comprises an exclusive-OR circuit having its respective input terminals coupled to opposite sides of the noise gate for providing an alarm pulse at its output only when a spurious signal is applied to the input of the noise gate at times when it is not passed through the gate. The output of the exclusive-OR circuit is coupled to the set input of an alarm latch circuit comprising a bistable multivibrator for producing an output signal which is employed to activate an indicator. The output of the noise gate is also coupled to the reset input of the alarm latch circuit in order to reset the alarm circuit automatically when normal signal pulses are passed through the noise gate. It applies to consistometer apparatus of the type wherein the consistency of a stream of material such as grease is measured by measuring the deflection of a flexible resilient member located in the stream and rotated at a constant rate about an axis which is parallel to the direction of flow of the stream by measuring any time delay of the resilient member due to such deflection as compared to a rigid reference member rotated in synchronism with the resilient member. Means are provided for periodically detecting the resilient member and rigid reference member as they are rotated past respective magnetic sensors. Means are coupled to the respective magnetic sensors for generating respective electric pulses, the first of which has a leading edge corresponding to the time when the reference member crosses the center of the reference sensor, and the second of which has a leading edge corresponding to the time when the resilient detector member crosses the center of the detector sensor. The first pulse is supplied through a noise gate to the set input of an RS flip-flop circuit for initiating a third pulse and the second pulse is supplied to the reset input of the RS flip-flop for terminating the third pulse after a time duration corresponding to the interval between the respective leading edges of the first and second pulses. The noise gate is controlled by a latch circuit having its set and reset inputs coupled to means including the reference and detector sensors, respectively, for controlling the gate so that it passes pulses to the set input of the RS flip-flop only during selected time intervals when the rotating members are in the vicinity of their respective sensors.

3,668,678

BULB OUTAGE INDICATOR FOR MULTI-LAMP CIRCUITS

Philip J. Porter, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1970, Ser. No. 77,230
Int. Cl. B60q *1/38*
U.S. Cl. 340—251 **1 Claim**



A bulb outage indicator in conjunction with a vehicle turn signal flasher circuit. The flasher circuit includes a relay periodically energized and deenergized to control a set of normally open contacts to supply current from a source to the turn signal lamps. The relay also includes a second set of normally open contacts in series with the source, a set of normally closed contacts, and an indicating lamp. The set of normally closed contacts is controlled by a current sensitive coil in series with the vehicle turn signal lamps. The current sensitive coil is sensitive to the total current supplied to the lamps when all the lamps are operating and is insensitive to the current supplied to the lamps when one or more of the lamps have failed. When one of the turn signal lamps has failed, the set of normally closed relay contacts remains closed and the two sets of normally open relay contacts periodically flash the remaining turn signal lamps and the indicator lamp to indicate a lamp failure.

3,668,679

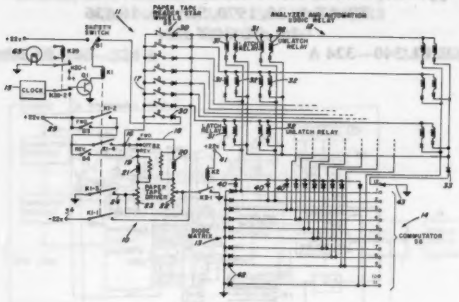
AUTOMATED ANALYZER OF MACHINE OPERATION

Martin A. Vallent, Stamford, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 18, 1971, Ser. No. 116,426
Int. Cl. G01m *15/00*
U.S. Cl. 340—267 R **7 Claims**

An automatic analyzer of the operation of machinery having sensors coupling various machine components to produce electrical signals which sensor output signals are applied to the analyzer in accordance with a program of sampling by a taped program controlling relay switches to compare the voltage amplitude of an electrical signal from the machine component or to compare the harmonics of noise from the

machine component with a predetermined reference to shut down the analyzer to further sampling and to indicate a fault



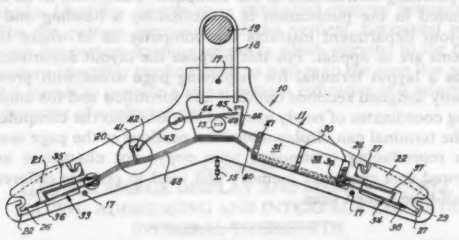
whenever the machine component signal is in excess of the reference until the fault is corrected.

3,668,680

COAT HANGER HAVING THEFT ALARM

Donald P. Spalding, 102 Minges Circle, Battle Creek, Mich., and James G. Close, 3215 29th St., Lubbock, Tex.

Filed Nov. 9, 1970, Ser. No. 87,749
Int. Cl. G08b *13/14, 21/00*
U.S. Cl. 340—280 **4 Claims**



A garment hanger having an alarm buzzer and actuating battery, and a key the insertion of which disables the alarm system and the removal of which places the system in actuatable condition. One or more switches are provided in the circuit adapted to be maintained in the open condition when a garment is supported by the hanger and to close the circuit to actuate the alarm when the garment is removed while the key is not disposed in the key socket of the hanger for instituting the disabling condition.

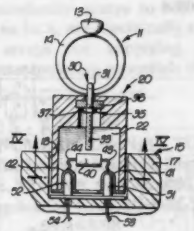
3,668,681

ANTITHEFT MERCHANDISE DISPLAY SYSTEM

Selwyn Kaplan, 7924 Cowan Ave., Los Angeles, Calif.

Filed Feb. 4, 1971, Ser. No. 112,600
Int. Cl. G08b *13/14*
U.S. Cl. 340—280 **10 Claims**

A multiplicity of pedestals, each individually locked to a ring or other article of merchandise, each receivable in a socket in a jewelry box or other display apparatus with a resistor in each of the pedestals. The resistors in a particular system desirably differ among themselves in value of their resistance. When the pedestals are all inserted in their sockets, their resistors form one leg of a Wheatstone bridge circuit to balance the bridge and illuminate a pilot lamp to indicate that the system is in operation. Removal of one of the pedestals, or the substitution of a pedestal having a resistor of incorrect value, will unbalance the Wheatstone bridge circuit and thereby extinguish the pilot lamp and illuminate a warning signal lamp, which, unless extinguished by switch means under the operator's control, remains lighted until a pedestal



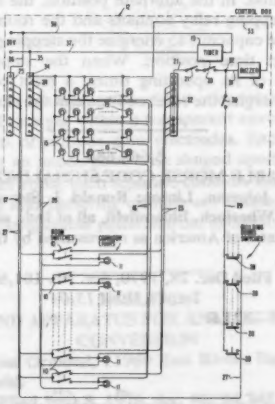
having the proper resistance is replaced. The pedestal has a rectangular cross section for properly orienting the ring with respect to the jewelry box, and has a hook with an extended leg which is threaded into a fastener rotatable relative to the pedestal, to move the hook toward and away from the pedestal to releasably lock the ring to the pedestal.

3,668,682

NURSE CALL AND ALARM SYSTEM FOR NURSING HOMES AND THE LIKE

Charles L. Barbee, Hawley; Harlan D. Williams, and James R. Stracener, both of Abilene, all of Tex., assignors to Texas Oil Electric Co., Abilene, Tex.

Filed Nov. 20, 1970, Ser. No. 91,307
Int. Cl. H04n *7/00*
U.S. Cl. 340—286 R **3 Claims**

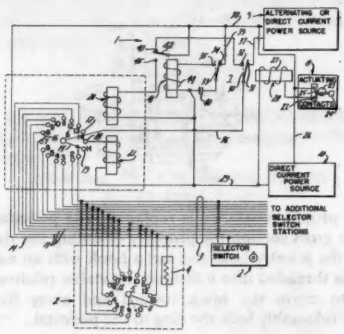


An integrated nurse call, fire alarm and building door protection system embodies a central control box and panel at the nurse station having individual room indicator lights and a common buzzer, responsive to individual patient-actuated room switches. Corridor lights are also provided at the doors of individual rooms. The system also embodies building exit door switches which respond to the opening of an exit door to sound the buzzer, thus preventing patients and others entering or leaving the building unnoticed. The buzzer can be silenced by a nurse at the central control panel but the indicator lights must be extinguished in the patients' rooms and cannot be extinguished from the beds. The fire alarm system features plural zones, each having fire sensing means, a common alarm bell, indicator lights for the zones on the central control panel, and individual testing switches for the zones.

3,668,683
PERIODIC TIMED SWITCHING APPARATUS

John W. Cremer, Elm Grove, and Norman A. Krohne, West Allis, both of Wis., assignors to Cremer Engineering Company, Inc., Milwaukee, Wis.

Filed Oct. 29, 1969, Ser. No. 872,097
Int. Cl. G08b *1/08*
U.S. Cl. 340—309.4 9 Claims

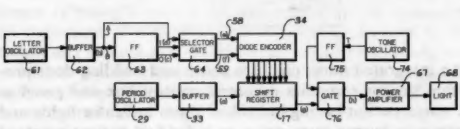


This disclosure relates to a motel call system for waking the room occupants at a requested time. Each room is connected to the central station by a single cable having one common return line and a signal line for each time. A rotary selector switch selectively connects a bell to one of the cable signal lines. The central station includes a rotary stepper relay switch selectively connecting the signal line to a power supply via a double pole, double throw control relay which is energized periodically via timed contacts. The control relay supplies power to the stepper relay and to a timing capacitor in one position. In the alternate position, the relay short circuits the stepping relay contacts and the room stations, and connects the capacitor to energize the stepping relay to move to the next time position. When the stepper relay has scanned all of its operating times, a reset contact is connected to energize the reset coil to reset the stepper relay.

3,668,684
PORTABLE MORSE CODE SIGNALING DEVICE

Donald W. Johnson, Linton; Ronald J. Stovall, Crane, and Larry A. Wheelock, Bloomfield, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 28, 1970, Ser. No. 101,693
Int. Cl. H04f *15/04*
U.S. Cl. 340—321 R 3 Claims

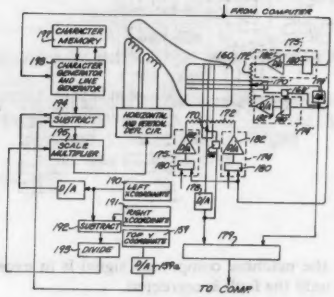


A signaling device for producing a light that flashes a Morse code signal. A light source is energized by a source of energy and circuit means are provided to energize the light source according to an output signal from a shift register comprised of a plurality of flip-flops. A diode encoder having a plurality of switches is provided to select flip-flops that are to be set which, upon clearing of the shift register, provides a Morse code signal. A first oscillator is provided to pulse the shift register and a second oscillator is provided to pulse the diode encoder for resetting the flip-flops.

3,668,685
COMPOSING METHOD AND APPARATUS

Robert M. Horvath, Parma, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Feb. 20, 1970, Ser. No. 16,626
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 6 Claims

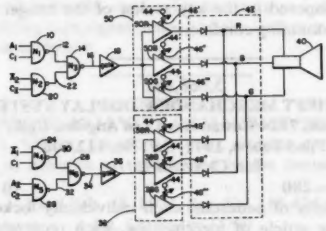


Composing method and apparatus for publications such as newspapers in which copy from various sources is entered into a computer in coded form f or use in controlling a phototypesetter to prepare a page copy. Certain copy including artwork which may be half tone or continuous tone is scanned to provide the numerical data necessary for controlling the phototypesetter while text material is first edited on an editing terminal and then stored with or without phototypesetting instructions in the computer. Each item to be included in the publication is identified by a heading and a layout department instructs the computer as to where the items are to appear. For this purpose the layout department has a layout terminal for displaying page areas with previously assigned sections outlined and identified and for entering coordinates of newly assigned sections into the computer. The terminal can display magnified portions of the page area. In reproducing continuous tone copy, dot characters are stored in a character memory and used to provide different half-tone screen sizes.

3,668,686
CONTROL APPARATUS

Garry G. Strohmeyer, Hacienda Heights, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 6, 1969, Ser. No. 831,185
Int. Cl. G08b *5/22*
U.S. Cl. 340—324 A 1 Claim

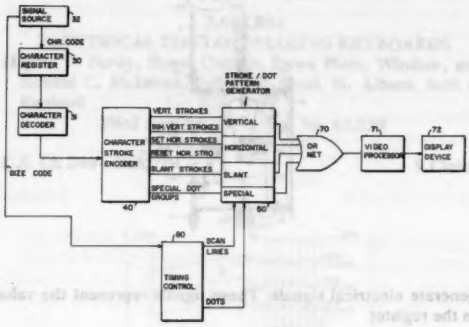


Information is displayed on a color cathode ray tube in a color that contrasts with a background color. This information may be optionally obliterated by causing the information and background to be displayed in the same color. Logic circuitry combines information and color data to control display color.

3,668,687
RASTER SCAN SYMBOL GENERATOR

David B. Hale, Claremont, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 17, 1969, Ser. No. 877,323
Int. Cl. H04n 3/00
U.S. Cl. 340—324 A 15 Claims

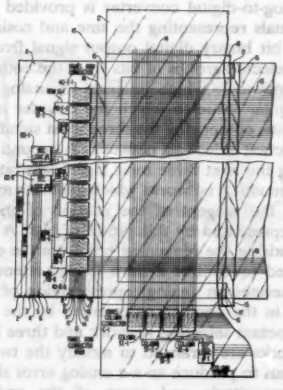


A raster scan character generator which forms different sized characters with dot pattern forming nets which are shared by characters employing common dot patterns. The generator includes a timing control which responds to a size code to selectively change the dot signal frequency as well as to perform a size conversion operation on the odd and even scan line signals. A character stroke or dot pattern encoder responds to a selected character to provide dot pattern or stroke identifier signals to a stroke/dot pattern generator. The dot pattern generator includes vertical, horizontal and slant dot pattern forming networks which respond to the dot pattern identifier stroke signals as well as to the scan line and dot signals to provide a signal pattern indicative of a selected character of a selected size.

3,668,688
GAS DISCHARGE DISPLAY AND MEMORY PANEL HAVING ADDRESSING AND INTERFACE CIRCUITS INTEGRAL THEREWITH

Larry J. Schmersal, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Dec. 29, 1969, Ser. No. 888,741
Int. Cl. H01j 17/48; H05b 41/44
U.S. Cl. 340—324 R 8 Claims

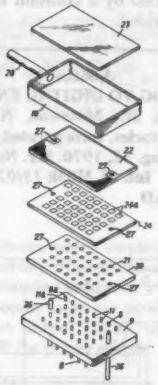


There is disclosed a method and apparatus for reducing the number of wires to gaseous discharge display/memory panels. Logic circuit circuits are combined with interface pulsing circuits which are electrically floated on the sustainer voltage for the panel and the interfacing and logic circuits are mounted integrally on panel support plate extensions. In addition to conductor arrays forming matrix cross points for locating a discrete discharge site, edge extension of support plates carry directly on the plates or on substrates bonded thereto additional conductor arrays to the interfacing and logic circuits which, in turn, are electrically connected to the matrix conductor arrays for supplying sustaining and discharge condition manipulating potentials thereto.

3,668,689
ALPHA-NUMERIC DISPLAY TUBES

James John Drage, The Island, Uxbridge, England

Filed Dec. 12, 1969, Ser. No. 884,486
Claims priority, application Great Britain, Dec. 12, 1968, 59,143/68
Int. Cl. G08b 5/22
U.S. Cl. 340—344 7 Claims

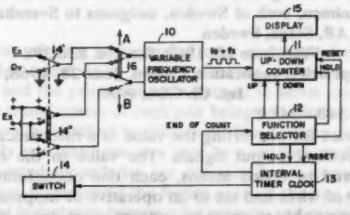


A display tube has a plurality of cathodes extending into an atmosphere of rare gas within a transparent envelope to form a visible matrix of cathode glow electrodes. Each cathode is surrounded by an anode plate with shaped apertures putting a compartment about each separate cathode. Electronic coding, decoding and buffering circuits are connected to form individually recognizable patterns from excitation of selected cathodes.

3,668,690
METHOD AND APPARATUS FOR ANALOG TO DIGITAL CONVERSION

Alfred Newman Ormond, 11969 East Rivera Road, Santa Fe Springs, Calif.

Filed June 8, 1970, Ser. No. 44,245
Int. Cl. H03k 13/02
U.S. Cl. 340—347 NT 7 Claims



An analog voltage signal is converted to a digital output reading by applying it to a variable frequency oscillator, the

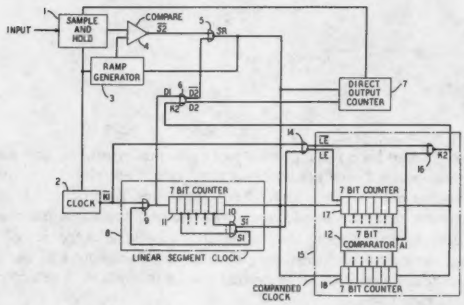
output frequency of which is proportional to the applied signal. Initially, the oscillator is set to oscillate at a given reference frequency for zero voltage input signals. The analog signal is then applied to the oscillator for a first given time interval. The output of the oscillator is counted by an up-down counter during this first period to provide a count proportional to the sum of the reference frequency and frequency resulting from the analog signal. The input applied to the oscillator is then changed to either zero volts or the reversed polarity of the analog signal during a second given time interval and the direction of the counter is changed to count the output of the oscillator in a down direction during this second time interval. The resulting counting total after the first and second time intervals registered in the counter is then directly proportional to the value of the analog signal, the count from the reference frequency having been subtracted out over the two time intervals. Any drift effects in the variable frequency oscillator are thus cancelled and a more accurate digital output reading corresponding to the analog signal results. Further features of the method and apparatus contemplate providing an output count in the form of a ratio of a number corresponding to the analog signal and a fixed number provided by a constant input signal so that a scaling factor is provided.

3,668,691

ANALOG TO DIGITAL ENCODER

John Robert Sergo, Jr., Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1970, Ser. No. 63,171
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **4 Claims**



An encoder employing level elimination companding for higher level input signals wherein a progressively increasing number of quantum levels are eliminated between selected levels with the number of levels eliminated increasing by one for each level selected during the companding phase.

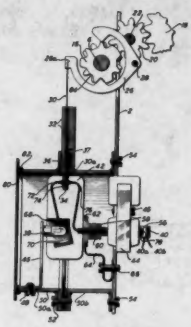
3,668,692

CONVERTING DEVICE

Gosta Roland Englund, Stockholm, and Richard Reuben Tice, Skarholmen, both of Sweden, assignors to Svenska Dataregister AB, Solna, Sweden

Filed June 25, 1969, Ser. No. 836,398
Claims priority, application Sweden, June 28, 1968, 8847/68
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 P **9 Claims**

A device for converting the value in a mechanical register into electrical output signals. The value in the register is transferred to coded means, each one cooperating with a number of wires and set to an operative or inoperative position, (being able to cover or uncover apertures in a stationary disc). A rotating sensing finger, comprising optical fibers, scans the apertures in sequence and depending on the apertures being covered or exposed transmits light from a stationary light source to a stationary light sensitive device to



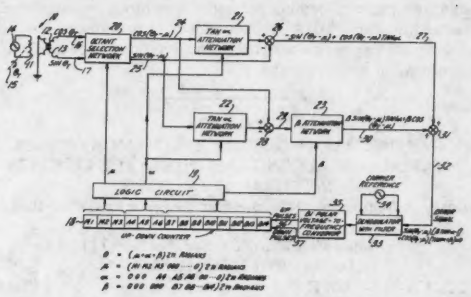
generate electrical signals. These signals represent the value in the register.

3,668,693

ANALOG-TO-DIGITAL CONVERTER

Bradley C. Eaton, Pompton Plains, and Marvin Masel, West Englewood, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed July 20, 1970, Ser. No. 56,603
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 SY **6 Claims**



An analog-to-digital converter is provided for converting analog signals representing the sine and cosine of an angle into a 14 bit binary digital output signal from an up-down counter. Selected groups of bits from the counter control attenuation networks which generate an analog representation of the angular value to which the counter is set. The first group of bits, comprising the three most significant bits, controls an octant selection network. A second group of bits, comprising the next three most significant bits, controls two ladder attenuation networks which generate analog representations of the tangent of the portion of the angle in the counter represented by this group of bits. A third group of bits, comprising the remaining bits from the counter output, is employed to control a third ladder attenuation network which generates an analog representation of the portion of the angle in the counter represented by the third group of bits. The octant selection network and three ladder attenuation networks are arranged to modify the two-phase analog input signals to produce an a-c analog error signal representing the magnitude and sense of the angular deviation between the counter setting and the angle represented by the analog input signals. The AC error signal is multiplied by a

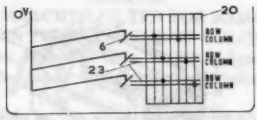
carrier voltage in a phase-sensitive demodulator to produce a bipolar DC signal which is then applied to a bipolar voltage-to-frequency converter. The output of the voltage-to-frequency converter consists of two series of pulses which are employed to drive the up-down counter to a null setting wherein it produces a binary digital output signal representing the angle defined by the analog input signals.

3,668,694

ELECTRICAL CONTACT-MAKING KEYBOARDS

Haydn V. Purdy, Down Cottage, Down Place, Windsor, and Ronald C. McIntosh, 7 Avenue Road, St. Albans, both of England

Filed Aug. 10, 1970, Ser. No. 62,530
Int. Cl. G08c 9/08
U.S. Cl. 340—365 9 Claims



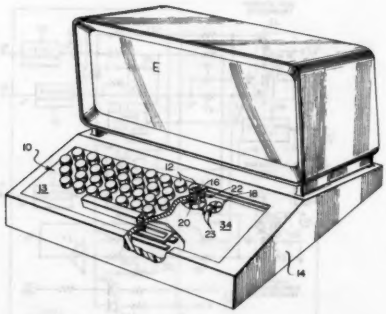
A series of laterally spaced brackets are secured together by a printed circuit board on which is mounted a parallel array of L-shaped wires having their short legs molded in a plastic block and their long legs disposed in slots in a plastic guide member. Plastic keys are pivoted at one end to a bar supported by the brackets, and have plugs at an intermediate position which are guided into predetermined slots in the guide member when the keys are depressed. Key circuits are molded into each key and, upon contact of the plug with the long leg of an L-shaped wire in the selected slot, connect two binary bit wires constituting the binary code of the depressed key to a binary code terminal strip.

3,668,695

KEYBOARD APPARATUS

William D. Gabor, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Original application Oct. 10, 1966, Ser. No. 598,558, now Patent No. 3,588,875, dated June 28, 1971, which is a continuation-in-part of application Ser. No. 496,031, Oct. 14, 1965, now abandoned. Divided and this application July 1, 1970, Ser. No. 60,200
Int. Cl. G08c 9/00
U.S. Cl. 340—365 5 Claims



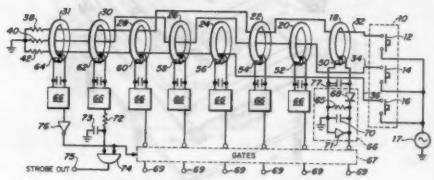
A keyboard encoder comprises a set of keys. Each key is in juxtaposition with one or more field-responsive elements associated with that key, the outputs of the field-responsive elements being conveyed to output terminals of the encoder. Actuation of a key alters the field to which the elements associated therewith respond. The number of elements associated with each key and the connections of these elements to the output terminals correspond to the output code for the character represented by the key. Consequently, the responses of the field-responsive elements to actuation of a key provide a directly encoded representation of the corresponding character at the output terminals. Also disclosed is an elongated switch bar in which contact is readily made even though the switch bar is depressed at either of the two ends thereof.

3,668,696

RING CORE KEYBOARD ENTRY DEVICE

Harry E. Brawley, Jr., Lexington, Mass., assignor to Data Electronics Corporation, Burlington, Mass.

Filed Sept. 28, 1970, Ser. No. 76,163
Int. Cl. G08c 1/00; G11c 17/00
U.S. Cl. 340—365 5 Claims



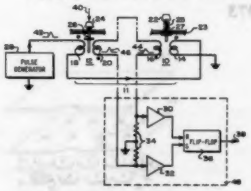
A keyboard entry device which employs a plurality of ring cores which are selectively threaded in a different combination by leads from a plurality of keys in a keyboard. The keys serve to connect the cores to an a-c power source, and each core is coupled to an output circuit which is resonant at about the frequency of the power source.

3,668,697

NONCONTACTING KEYBOARD

David S. Cochran, Palo Alto, and Glenn E. McGhee, Los Altos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 24, 1970, Ser. No. 74,949
Int. Cl. G08c 1/00
U.S. Cl. 340—365 9 Claims



An array of keys is suspended over an array of transformers. The transformer secondaries are series connected together and the primaries are arranged in series connected pairs, the transformers of each pair being oppositely poled. A ferrite core is attached to each key. The primary pairs are electrically energized one at a time by a scanner, and the series connected secondaries are connected to a comparator. When a key is depressed the ferrite core on the key changes the mutual inductance between the primary and secondary of the corresponding transformer, causing the comparator to register a depressed key. An information output available from

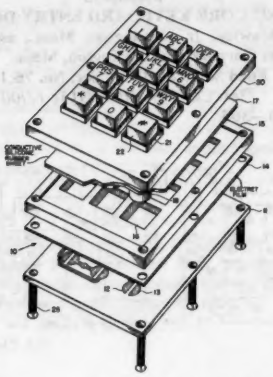
the scanner and comparator tells which key is depressed, and the scanner halts when a key is depressed to prevent an erroneous output due to more than one simultaneously depressed key.

3,668,698

CAPACITIVE TRANSDUCER

Sayman Fadil Demirdjioghlou, Ottawa, and Robert Maarten Van Dyk, Dunrobin, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Dec. 17, 1970, Ser. No. 99,108
Int. Cl. G08c *9/02*
U.S. Cl. 340—365 **9 Claims**



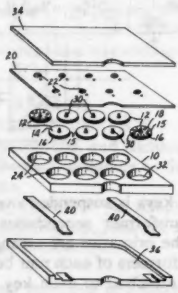
A capacitive transducer, for a contactless switch, which utilizes an electret sandwiched between two conductors, one of which is a conductive elastomer. Depression of the conductive elastomer produces a voltage pulse across the two conductors which is utilized to turn on a field-effect transistor, thus providing a low impedance path for the switch.

3,668,699

MAGNETIC VIEWER FOR DISKS HAVING MAGNETIC POLARITY ALIGNMENT

Peter J. Vogelgesang, Roseville, and John D. Holm, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1970, Ser. No. 88,589
Int. Cl. G08b *5/24, 5/26*
U.S. Cl. 340—373 **10 Claims**



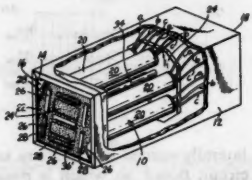
A device for providing a visual indication of data represented by magnetic polarity alignments at each of a plurality of disparate magnetized regions defining a fixed two-dimensional pattern. The device comprises a board containing a plurality of disks positioned in said fixed pattern, which disks are constrained to rotate with their flat surfaces in the plane of the fixed pattern. Each disk comprises magnetized magnetic material having a magnetic polarity alignment parallel to a given flat surface of the disk and a plurality of visible indicia positioned on the given flat surface of the disk in a predetermined order in relation to the polarity alignment. A mask is positioned on the board to cover the disks and contains apertures aligned over a predetermined portion of each disk position for providing a view of whichever ones of the visible indicia on the disks are rotatably aligned with the apertures.

3,668,700

SEGMENTAL READOUT DEVICE

Alfred Skrobisch, Huntington Station, N.Y., assignor to Allard Instrument Corp., Westbury L. I., N.Y.

Filed Nov. 14, 1969, Ser. No. 876,763
Int. Cl. G09f *11/02*
U.S. Cl. 340—378 **5 Claims**



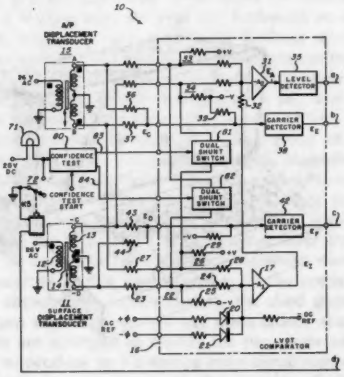
A segmental readout device of the digital or alphanumeric type comprising an assembly of a plurality of closely spaced elongated electromagnetic coils, each having a core of ferrous metal, and in which the display elements comprise cylindrical magnet segments each provided with a surface character to be displayed or exhibited, magnetization of each electromagnet being effective to polarize its core to effect a bodily movement and a rotation of its related magnet segment between character exhibiting and non-exhibiting positions. A specially structured arrangement is devised for providing return magnetic flux paths to eliminate strays in the magnetic interaction between the separate magnet segments and their cores that is the cause of false displays taking place.

3,668,701

MONITORING APPARATUS

Billy T. Mayberry, Scottsdale, and Edwin B. Sirrine, Phoenix, both of Ariz., assignors to Sperry Rand Corporation

Filed Aug. 20, 1970, Ser. No. 65,573
Int. Cl. G08b *19/00*
U.S. Cl. 340—409 **9 Claims**



A monitoring circuit monitors separate transducers energized by an alternating current carrier for determining if a

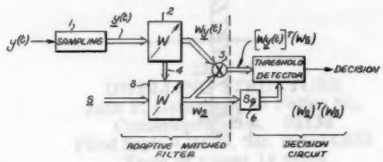
failure to track occurs and for detecting failure of components of the monitoring circuit. The amplitude and phase of the transducer outputs and a.c. and d.c. tracer signals normally combine to produce a tracking-within-tolerance signal. The transducers are individually monitored for carrier output indicative of their operativeness. A pair of relay driver amplifiers responsive to the tracking signal and each carrier signal are normally alternately energized to maintain relays in a normally energized condition. Tracking failure or failure of any component in the monitoring circuitry causes disruption of the alternate energization of the relay driver amplifiers causing one or more relays to deenergize and actuate an alarm. A test sequence provides for a system check by progressively short circuiting portions of a tracking monitoring input circuit to produce an alarm signal followed by an alarm off condition.

3,668,702

ADAPTIVE MATCHED FILTER FOR RADAR SIGNAL DETECTOR IN THE PRESENCE OF COLORED NOISE

James W. Jones, Granada Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,426
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R **7 Claims**



System Block Diagram.

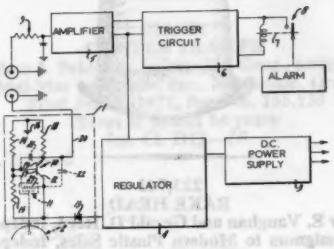
A system for electromagnetic signal detection having an adaptive circuit generating a time-varying matched filter characteristic whereby the statistical properties of additive noise appearing in a receiver output may be "tracked." The statistical behavior of "colored" noise is evaluated and the matched detection filter characteristics are modified accordingly, so that detector performance for signals in "colored" noise is comparable to that achieved by an optimum invariant matched filter for signal detection in "white" noise.

3,668,703

MOTION DETECTOR

Carl F. Klein, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 31, 1969, Ser. No. 796,945
Int. Cl. G01s 9/02; G08b 13/22
U.S. Cl. 343—5 PD **11 Claims**



This disclosure relates to an intrusion detector having a microwave transmitter and receiver employing a single antenna. A transistor is interconnected through the inductive cavity of a coaxial line to define a Colpitts' oscillator for transmitting of energy of a given frequency into the area to be protected. The transistor is exposed to both the transmitted and the echo signal in the cavity. The non-linear characteristic of the transistor mixes the transmitted and the received signals and includes an output across an emitter resistor which is equal to the difference of the transmitter frequency and the echo frequency i.e., the Doppler frequency. The latter signal is amplified and actuates a Schmitt trigger circuit for controlling an alarm.

DESIGNS

JUNE 6, 1972

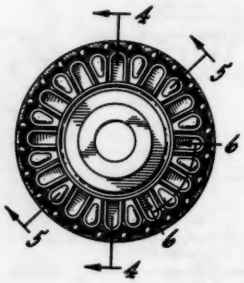
223,742
HAT
Sinclair L. D. Johnson, 5200 Kelway Road, Baltimore, Md. 21212
Filed Nov. 21, 1969, Ser. No. 20,211
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—257

223,743
RAKE HEAD
Woodrow E. Vaughan and Gerald D. Reed, Independence, Mo., assignors to Modern Plastic Sales, Independence, Mo.
Filed Oct. 5, 1970, Ser. No. 25,327
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—13

223,744
FILE
James Alva Coon, West Sacramento, and Elwin Theobald, Fair Oaks, Calif.; said Theobald assignor to said Coon
Filed Dec. 18, 1970, Ser. No. 26,564
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90

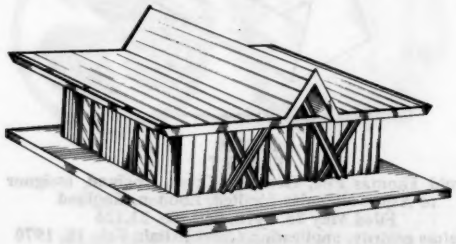
223,745
DOOR HANDLE AND LOCK PLATE UNIT
John R. Gerlach, 1461 Solar Drive, Monterey Park, Calif. 91754
Filed July 29, 1970, Ser. No. 24,203
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—170

223,746
ESCUTCHEON PLATE
Martin R. Lambertz, New Hamburg, Ontario, Canada, assignor to Amerock Corporation, Rockford, Ill.
Continuation-in-part of design application Ser. No. 17,346, May 26, 1969. This application May 25, 1970, Ser. No. 23,119
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179

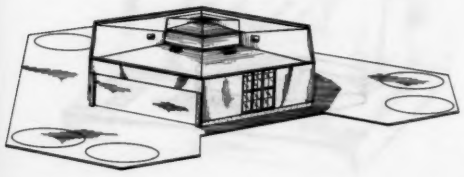


223,747
LOCKING NUT
Katsumi Shinjo, 8, 6-chome, Asahi Minamidori, Nishinariku, Osaka-shi, Japan
Filed June 26, 1970, Ser. No. 23,685
Term of patent 14 years
Int. Cl. D8—*10*
U.S. Cl. D8—274

223,748
DWELLING STRUCTURE
Jack P. Gensemer, 50 Follen St., Cambridge, Mass. 02138
Filed Sept. 4, 1970, Ser. No. 24,832
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

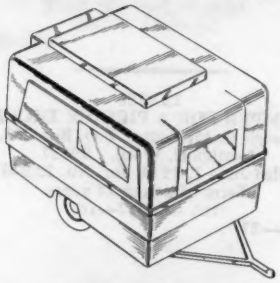


223,749
AIRCRAFT SERVICE STRUCTURE
Jack Jones, Wichita, Kans., assignor to Cessna Aircraft Company, Wichita, Kans.
Filed Oct. 30, 1970, Ser. No. 25,732
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



223,750
SEALING ELEMENT
William J. Berchou, Buffalo, and Freel F. Bryan, Williamsville, N.Y., assignors to Acme Highway Products Corporation, Buffalo, N.Y.
Filed Sept. 10, 1969, Ser. No. 19,098
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6

223,751
CAMPER TRAILER
William J. Palumbo, Milwaukie, Oreg., assignor to Mel-Mar Industries, Inc., Milwaukie, Oreg.
Filed Jan. 8, 1971, Ser. No. 105,139
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3

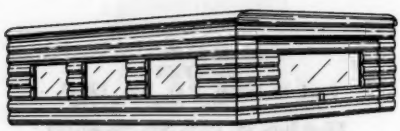


223,752
BUMPER
Paul B. Nunn, P.O. Box 19043, Oklahoma City, Okla. 73119
Filed June 29, 1970, Ser. No. 23,706
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

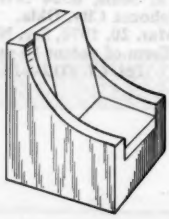
223,753
VEHICLE TIRE CARRIER ACTUATING LEVER
Bob J. Seals, 8324 NW. 33rd, Oklahoma City, Okla. 73123
Filed Mar. 20, 1970, Ser. No. 21,991
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

223,754
TONNEAU COVER FOR DUNE BUGGIES
Henry C. Arnoldy, 30417 J. Carls, and William C. Stanko, 30233 J. Carls, both of Roseville, Mich. 48066
Original design application Dec. 3, 1968, Ser. No. 14,760, now Patent No. 216,783, dated Mar. 10, 1970. Divided and this application Jan. 7, 1970, Ser. No. 20,789
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—27

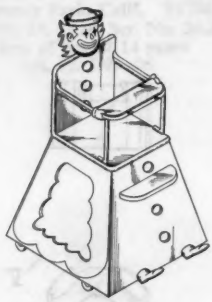
223,755
CAMPER FOR A PICK-UP TRUCK
Joseph R. McNamee, P.O. Box 253, Northport, Wash. 99157
Filed June 1, 1970, Ser. No. 23,248
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—27



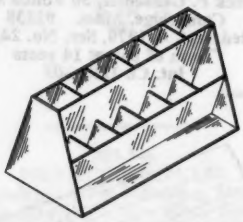
223,756
ARM CHAIR
Saul G. Steinhart, 21 Austin Road, Hamden, Conn. 06512
Filed Sept. 3, 1970, Ser. No. 24,824
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1



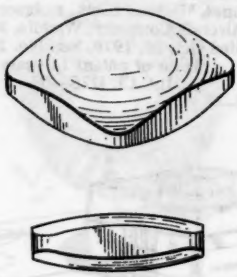
223,757
HIGH CHAIR
Paul S. Kinstley, Portland, Tex., assignor to Oro-Lanza Enterprises, Inc.
Filed Sept. 3, 1970, Ser. No. 24,826
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1



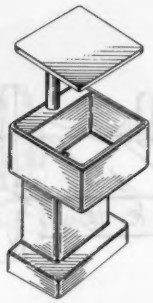
223,758
PIPETTE STORAGE RACK
David E. Berg, 3326 S. 78th St., Omaha, Nebr. 68124
Filed Oct. 15, 1970, Ser. No. 25,498
Term of patent 14 years
Int. Cl. D24—*02;* D6—*09*
U.S. Cl. D16—1



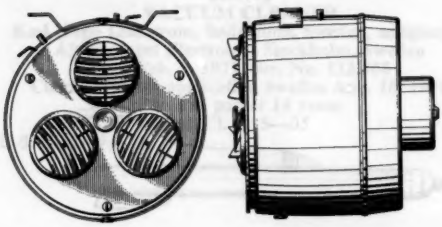
223,759
TABLET
Harold Thomas File, Gerrards Cross, England, assignor to Aspro-Nicholas Limited, London, England
Filed May 25, 1970, Ser. No. 23,125
Claims priority, application Great Britain Feb. 18, 1970
Term of patent 14 years
Int. Cl. D28—*01;* D1—*02*
U.S. Cl. D16—3



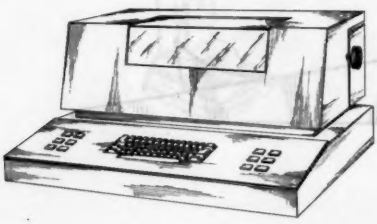
223,760
COMBINATION BABY BATH AND DRESSING STAND
Shirley Daniels Chestine, 3500 Gibson Bldg. 402, Unit 961, Detroit, Mich. 48201
Filed Oct. 28, 1970, Ser. No. 25,691
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52



223,761
AIR CONDITIONER FOR VEHICLES
Earnest H. Patrick, Fort Lauderdale, Fla.
Filed Apr. 22, 1969, Ser. No. 16,849
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



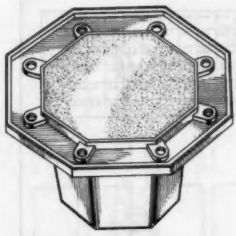
223,762
DATA PRINTER KEYBOARD CONSOLE
Loring C. Bixler, Vestal, Arnold M. Davis and Walter S. McCormick, Jr., Poughkeepsie, and Edward R. Wiener, Vistal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 21, 1970, Ser. No. 26,608
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



223,763
SWITCH
Yasuo Kodaira, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 11, 1970, Ser. No. 24,414
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

223,764
ENTERTAINMENT CENTER
DeWitt Y. Gorman, P.O. Box 23323, Houston, Tex. 77032
Filed Aug. 26, 1970, Ser. No. 24,699
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

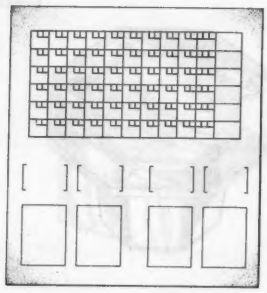
223,765
TABLE WITH REVERSIBLE TOP OR SIMILAR ARTICLE
Charles M. O'Leary, 525 S. Irving Blvd., Los Angeles, Calif. 90005
Filed Oct. 27, 1969, Ser. No. 19,725
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



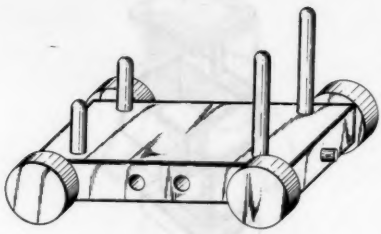
223,766
GOLF CLUB HEAD OR THE LIKE
Ted G. Houghtaling, 541 S. State Rte. 19, Fremont, Ohio 43420
Filed Mar. 13, 1970, Ser. No. 21,887
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,767
GOLF CLUB HEAD OR THE LIKE
Ted G. Houghtaling, 541 S. State Rte. 19, Fremont, Ohio 43420
Filed Mar. 16, 1970, Ser. No. 21,922
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,768
GAME BOARD
Robert E. Anti, 94 Federal St., Springfield, Mass. 01105
Filed Sept. 14, 1970, Ser. No. 24,206
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



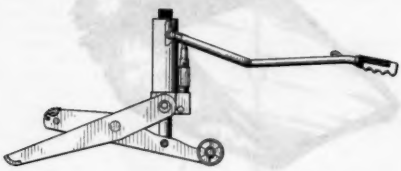
223,769
CHILD'S WHEELED TOY
Erkki Ruokonen, Helsinki, Finland, assignor to Aarikka-Koru, Helsinki, Finland
Filed Aug. 31, 1970, Ser. No. 24,776
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,770
TOY AIRPLANE
Harold Goodman, 65 Kings Highway, Middletown, N.J. 07748
Filed Dec. 14, 1970, Ser. No. 26,483
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15

223,771
COMBINATION VEHICLE LEVELING AND CHOCKING UNIT
Johnny Roney, Jr., 1626 Berkley Ave., Columbus, Ga. 31907
Filed Apr. 10, 1970, Ser. No. 22,373
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D41—1

223,772
FORK LIFT JACK
Roger L. Craft, St. Joseph, Mo., assignor to Gray Manufacturing Company, Inc., St. Joseph, Mo.
Filed July 15, 1970, Ser. No. 23,969
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D41—1



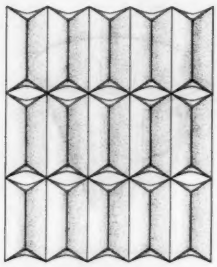
223,773
VACUUM CLEANER
Karl Hugo Lindstrom, Sollentuna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Feb. 3, 1971, Ser. No. 112,508
Claims priority, application Sweden Aug. 10, 1970
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—14

223,774
MOP WRINGER
Walter A. Swanson, 3615 Federal, Denver, Colo. 80211, and Michael E. De Souza, 5573 S. Washington, Littleton, Colo. 80120
Filed Feb. 6, 1970, Ser. No. 21,370
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—29

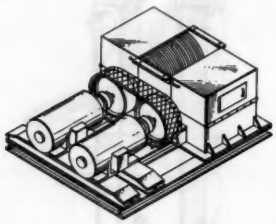
223,775
GLASS TUBE FLOWMETER
Harold W. Metzger, Warminster, Pa., assignor to Fischer & Porter Company, Warminster, Pa.
Filed Oct. 6, 1970, Ser. No. 25,351
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

223,776
LIQUID LEVEL GAUGE OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Feb. 8, 1971, Ser. No. 113,780
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

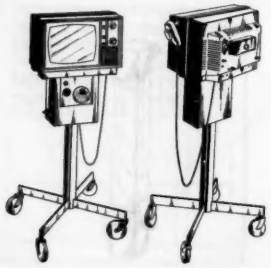
223,777
DECORATIVE GRILLE
Patrick L. Zampetti, Cranford, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.
Filed Dec. 30, 1969, Ser. No. 20,698
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D54—2



223,778
HAMMERMILL
Ernest F. Boger, 9018 37th SW., Seattle, Wash. 98126
Filed Oct. 14, 1970, Ser. No. 25,487
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1



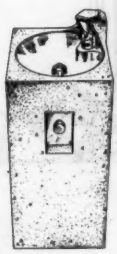
223,779
COMBINED MOBILE PEDESTAL MOUNT AND HOUSING FOR A COIN-OPERATED TELEVISION RECEIVER
Walter Leroy Abell, Jr., 6045 Round Hill Court, Columbus, Ga. 31904, and Harold C. Hogencamp, Rte. 2, Box 486, Smiths, Ala. 36867
Filed Aug. 31, 1970, Ser. No. 24,765
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D56—4



223,780
MICRO FICHE READER
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed July 23, 1970, Ser. No. 24,089
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1

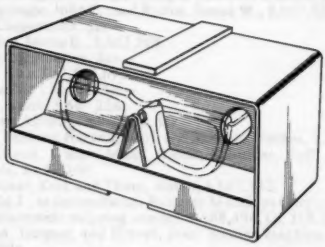
223,781
CYLINDRICAL DRINKING FOUNTAIN
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Fountain Company, Berkeley, Calif.
Filed Nov. 30, 1970, Ser. No. 26,231
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D67—4

223,782
POLYGONAL DRINKING FOUNTAIN
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Fountain Company, Berkeley, Calif.
Filed Nov. 30, 1970, Ser. No. 26,232
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D67—4

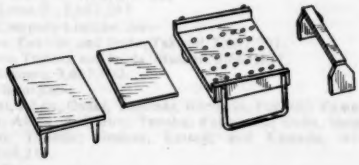


223,783
MOVEABLE SIGNAL LIGHT FOR STORE SALES
Robert M. Akers, Oklahoma City, Okla., assignor of a fractional part interest to Thomas Pickering
Filed Sept. 10, 1970, Ser. No. 24,924
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D72—1

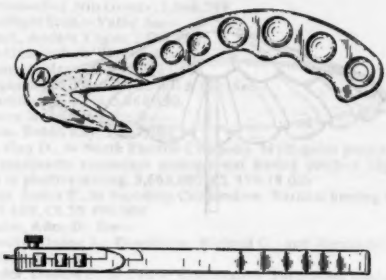
223,784
EYEGLASSES DISPLAY HOLDER
Gilbert Rios, Los Angeles, Calif., assignor to Superior Optical Company, Los Angeles, Calif.
Filed Dec. 9, 1970, Ser. No. 26,366
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



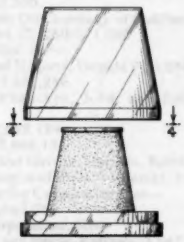
223,785
TRIPLEX BOARD USED IN PATHOLOGY
Joseph Navara, 2105 Walton St., Chicago, Ill. 60622
Filed Mar. 13, 1970, Ser. No. 21,885
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



223,786
TAPE AND BANDAGE CUTTER
Cecil E. Phillips and Fay M. Bennett, Eugene, Oreg., assignors to Saf-Pla Corporation, Eugene, Oreg.
Filed Dec. 31, 1970, Ser. No. 26,717
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—12



223,787
FALSE EYELASH HOLDER
David Seidler, 69—10 108th St., Forest Hills, N.Y. 11375
Filed June 1, 1970, Ser. No. 23,224
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



223,788
POCKETBOOK
Juliana M. Corridon, 7805 Takoma Ave., Takoma Park, Md. 20012
Filed Nov. 15, 1968, Ser. No. 14,477
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Int. Cl. D3—*02*
U.S. Cl. D87—3

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Hercules Economou, 812 NW. 8th Ave., Fort Lauderdale, Fla. 33311
Filed Sept. 1, 1970, Ser. No. 24,802
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

223,790
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Einosuke Miyachi, Tokyo, and Norio Aratani, Kawasaki-shi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 22, 1970, Ser. No. 21,034
Claims priority, application Japan Aug. 11, 1969
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—8

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Bala, Mitchell J.; and Blecherman, Sol S., to United Aircraft Corporation. Mechanism for controlling the thickness of a coating in a vapor deposition apparatus. 3,667,421, Cl. 118-7.000

Balchan, Anthony S.; and Cowan, George R., to Du Pont de Nemours, E. I., and Company. Method of treating solids with high dynamic pressure. 3,667,911, Cl. 23-201.

Baldwin, William K., Sr. Rear view mirror. 3,667,833, Cl. 350-303.000

Ball, Robert D., to Kearney-National Inc. Separable electrical connectors. 3,668,614, Cl. 339-111.000

Ballandras, Pierre, to Automobiles Peugeot, and Regie Nationale des Usines Renault. Device for starting and stopping a diesel engine. 3,668,410, Cl. 290-38.00r

Ballard, Wesley D.; and Staley, John H. Mattress spring bellows assembly as for hospitals, and the like. 3,667,075, Cl. 5-348.

Ballis, William L. Automatic pipeline welding method. 3,668,360, Cl. 219-61.000

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Bankovic, Atanasije M., to Societe Industrielle Honeywell Bull. Pulse generator apparatus. 3,668,437, Cl. 307-265.000

Banush, Russell S.; and Hagerty, Donald P., to Allied Chemical Corporation. Dissolution of metal with acidified hydrogen peroxide solutions. 3,668,131, Cl. 252-79.400

Barbee, Charles L.; Williams, Harlan D.; and Stracener, James R., to Texas Oil Electric Co. Nurse call and alarm system for nursing homes and the like. 3,668,682, Cl. 340-286.00r

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Barlow, Harold Monteagle, to British Railways Board. Hybrid made electric transmission line using accentuated asymmetrical dual surface wanes. 3,668,574, Cl. 333-155.000

Barnes, David L., 1/2 to Grossi, Paul A. Method and apparatus for treatment of respiratory disease. 3,667,463, Cl. 128-194.000

Barnett, Richard C.; and Boucher, James D., to General Electric Company. Control means for pressurized gas-fired space heater. 3,667,892, Cl. 431-31.000

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Barr, Ruth L. Playing cards with conventional bas-relief indicia. 3,667,759, Cl. 273-152.100

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Barrett, Edmund, to Jenkintown Metal Products, Inc.Motor operated child's swing. 3,667,756, Cl. 272-86.

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Barson, Fred; and Lehman, Herbert S., to International Business Machines Corporation. Fabrication of semiconductor devices with cup- shaped regions. 3,667,115, Cl. 29-571.

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Bauer, Dietrich; and Fratzscher, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for obtaining an asbestos-fiber material of a high degree of separation. 3,668,119, Cl. 210-42.

Baumgart, Walter, to VEB Barkas-Werke, Ifa-Kombinat fur Kraftfahrzeugteile Renak-Werke. Fuel injection valve. 3,667,684, Cl. 239-533.000

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Bergmeister, Eduard; Heckmaier, Joseph; Kirst, Paul-Gerhard; and Wiest, Hubert, to Wacker-Chemie G.m.b.H. Dispersion polymerized terpolymer of vinyl acetate, vinyl ester of a fatty acid, and vinyl chloride. 3,668,165, Cl. 260-29.60t

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Cohen, Ronald S., to Behavioral Controls, Inc. Speech training apparatus and method of teaching therewith. 3,667,138, Cl. 35-35.00c
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Conlon, William J., to Dynamics Corporation of America. Light powered by induction of variable impedance motor. 3,668,490, Cl. 318-245.000
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Corradini, Giorgio; Ghetti, Giuseppe; Cesca, Sebastiano; and Roggero, Arnaldo, to Snam Progettic S.p.A. Covulcanizable mixes comprising diene polymers or copolymers and low unsaturation terpolymers. 3,668,156, Cl. 260-5.

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Crabtree, Allen, to Imperial Chemical Industries Limited. Certain 6-hydroxy 2-(1H)pyridones. 3,668,211, Cl. 260-294.900

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Cramer, Roy A., Jr. Water moving apparatus for destratification, ice reduction and barnacle control. 3,667,873, Cl. 417-424.000

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Cull, Duncan E.; and Culbertson, Alvin E., to National Cash Register Company, The. Character coding, memory, and display system. 3,668,661, Cl. 340-172.5

Culpepper, Clifford, Jr. Method and apparatus for cleaning a textile reel and winding apparatus. 3,667,093, Cl. 28-55.3

Culver, Richard D., to Dresser Industries, Inc. Differential pulse height discriminator. 3,668,426, Cl. 307-235.000

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Currie, James H.; and Mick, Stanley H., to General Motors Corporation. Internal combustion engine with vented piston clearance spaces and method. 3,667,443, Cl. 123-193.00p

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Cyba, Henryk A., to Universal Oil Products Company. Reaction product of alkanolamine and two particular acids. 3,668,236, Cl. 260-485.00h

Cyba, Henryk A., to Universal Oil Products Company. Amine salts of phosphinic acid esters. 3,668,237, Cl. 260-485.00g

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Daniel, William H. Apparatus for collecting oil from the surface of a body of water. 3,667,610, Cl. 210-242.000

Daniels, David A.; Orem, Rowland L., Jr.; and Lard, Edwin E., to Grace, W. R., & Co. Catalyst and method of polyester polymerization. 3,668,139, Cl. 252-186.000

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Follett, Harold W. Portable parking indicator. 3,668,626, Cl. 340-51.000

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Foote, Daniel J., to Master Lock Company. Exhaust pipe protector lock. 3,667,260, Cl. 70-159.000

Ford, Edward J. Convertible furniture. 3,667,803, Cl. 297-119.

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Forschirm, Alex S.; and Trepasso, Louis E., to Celanese Corporation. Anti-soiling polyester textile material. 3,668,000, Cl. 117-138.8

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Fortmann, Manfred, to Interatom, Internationale Atomreaktorbau GmbH. Reversing rupture disc for protecting equipment from excessive pressure and method of manufacture. 3,667,644, Cl. 220-89.

Foster, Bennie J.; Gutowski, Gerald E.; and Hatfield, Lowell D., to Lilly, Eli, and Company. Process for preparing cepham compounds. 3,668,202, Cl. 260-243.00c

Foster, Ernest. Revolving door lock mechanism and trap floor assembly. 3,667,404, Cl. 109-8.000

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Frankenberg, Henry E., to Continental Can Company, Inc. Double boiler and throw-a-way food package. 3,667,667, Cl. 229-51.

Frankenfeld, John W.; Karel, Marcus; and Labuza, Theodore P., to Esso Research and Engineering Company. Esters of 1,3 diols and 1,3,5, x-polyols as additives for baked goods. 3,667,964, Cl. 99-90.00p

Frankenfeld, John W.; Karel, Marcus; and Labuza, Theodore P., to Esso Research and Engineering Company. Baked flour compositions containing aliphatic diols. 3,667,965, Cl. 99-90.00p

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Franz, Thomas C., to United Aircraft Corporation. Fuel cell system with pneumatic fuel flow control. 3,668,013, Cl. 136-86.00b

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Freelander, Israel Robert. Jack-in-the box including box with integral inner cylindrical wall. 3,667,155, Cl. 46-146.

Freiberger, Ronald D.; and Woolley, James L., to General Motors Corporation. Heater blower motor delay energizing means. 3,668,497, Cl. 318-471.000

French, William H.; and Ossanna, Oliver A., to Ashland Oil, Inc. Ultraviolet light bleaching of carboxylic acid esters and epoxy compounds. 3,668,091, Cl. 204-158.00r

French, William H.; and Ossanna, Oliver A., to Ashland Oil, Inc. Bleaching of carboxylic acid esters and/or epoxy compounds employing ultraviolet light. 3,668,092, Cl. 204-158.000

Frevel, Ludo K.: *See—*
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Fritsch, Rudolf Paul. Device for the plastication of powdery plastic materials. 3,667,733, Cl. 259-6.000

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Fry, Millard E.; and Bremer, Robert D., to General Motors Corporation. Circuit arrangement for accelerated continuous cleaning of self cleaning oven coatings. 3,668,371, Cl. 219-413.000

Fuchs, Francis J., Jr., to Western Electric Company, Incorporated. Apparatus and method for continuous material feeding and deformation. 3,667,267, Cl. 72-60.

Fuchs, Otto, to Dynamit Nobel AG. Process for the manufacture of open-pore poly- vinyl chloride foams having hydrophilic qualities which are capable of a reversible absorption and yielding of moisture. 3,667,997, Cl. 117-98.

Fuhrmann, Robert; Pisanchyn, John; and Koff, Fred William, to Allied Chemical Corporation. Beta hydroxyethoxy phenyl isopropylidene benzoic acid and ester derivatives method of preparation and polymers of said compounds. 3,668,182, Cl. 260-47.00c

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Fujimoto, Kentaro: *See—*
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Furness, Ralph William, to Cirkitrite Limited. Printed circuits. 3,668,003, Cl. 117-212.000

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Gough, John Richard Cox; Meaden, Geoffrey William; and Price, Michael Stuart Thomas, to United Kingdom Atomic Energy Authoritiy. Manufacture of nuclear fuel elements. 3,668,284, Cl. 264-0.500

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Hayasaka, Enakichi. Homopole type AC generator. 3,668,448, Cl. 310-166.000

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Schroeder, Peter, to Weber, Paul AG. Apparatus for keeping a state of tension constant on a material web which runs between successive pairs of driving rollers. 3,667,664, Cl. 226-30.
Schroeder, Theodore C., to Westinghouse Air Brake Company. Lightweight electromagnetic relay. 3,668,578, Cl. 335-202.000
Schuberth, Christian; and Steigerwald, Wolf-Erhard. Layer voltage divider with additional impedances. 3,668,600, Cl. 338-320.000
Schuler, Hansjorg; and Dopslaff, Hartmut, to Dopslaff, Julius, KG. Proportioning device, especially for water treatment systems. 3,667,495, Cl. 137-101.21
Schulz, Gerhard: *See—*
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Schumacher, Edward R. Laser stimulator assembly. 3,668,546, Cl. 331-94.500
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Schwake, William O., to Radioear Corporation. Hearing aid with changeable battery cover containing RF pickup coil. 3,668,334, Cl. 179-107.00r
Schwartz, Edwin L., to Rite Autotronics Corporation. Electrical connector assembly and timing light embodying same. 3,668,611, Cl. 339-75.00r
Schwartz, Robert A. D.; and Osterberg, Rodney P. Prismatic light louver. 3,668,381, Cl. 240-106.000
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Scope Incorporated: *See—*
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Scott, Albert Rockwood. Automobile towing assembly. 3,667,630, Cl. 214-86.00a
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Seifert, Friedrich; Bittscheidt, Josef; and Plenikowski, Johannes, to Chemische Werke Huls A.G. Cross-linked isotactic polybutene-1. 3,668,192, Cl. 260-79.50p

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Sekmakas, Kazys, to De Soto, Inc. Unsaturated ethers of polyalkoxy silanes and thermosetting systems containing copolymers thereof. 3,668,272, Cl. 260-826.

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Selenia Industrie Elettroniche Associats S.p.A.: *See—*
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Self Energising Disc Brakes Limited: *See—*
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Self, James M. Moldable metal powder compositions containing an elastomer and silica aquasols. 3,668,168, Cl. 260-29.70s

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Semour, Norman F., to Key Tronic Corporation. Keytop mount. 3,667,787, Cl. 287-53.00h

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Sergo, John Robert, Jr., to Bell Telephone Laboratories, Incorporated. Analog to digital encoder. 3,668,691, Cl. 340-347.0ad

Sesko, William J. Fare box with belt conveyor and coin size detector. 3,667,485, Cl. 133-8.000

Sessler, Gerhard Martin; Wallace, Robert Lee, Jr.; and West, James Edward, to Bell Telephone Laboratories, Incorporated. Touch-sensitive switch employing electret foil. 3,668,417, Cl. 307-113.000

Setescak, Linda Louise: *See—*
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Setina, John R. Automobile partition apparatus having horizontal sliding window portion mounted on guard plate. 3,667,801, Cl. 296-24.00r

Severynse, Gerard T., to Xerox Corporation. Ionized air cleaning device. 3,668,008, Cl. 134-1.000

Sewell, Curtis O. Door threshold and fastener assembly. 3,667,192, Cl. 52-213.

Sexton, Paul A. Hand type fish scaling device. 3,667,086, Cl. 17-66.

SFM Corporation: *See—*
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Shadduck, Laurine R. Food chopper. 3,667,519, Cl. 146-160.000

Shaffer, John W.: *See—*
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Shaner, Milo W.; and Cave, Robert S., to National Twist Drill & Tool Co. Combined drill and reamer construction. 3,667,857, Cl. 408-230.000

Shapiro, Alan R., to Bio-Design, Incorporated. Instrument for testing three-wire electrical outlets. 3,668,518, Cl. 324-51.000

Shapiro, Justin J. Device for deriving limited reciprocating motion from rotation motion. 3,667,651, Cl. 222-63.000

Sharpe, James F., to Acme Highway Products Corporation. Strip inserting apparatus. 3,667,105, Cl. 29-235.

Shea, Frank Joseph. Portable security vault. 3,667,406, Cl. 109-57.000

Shea, Frederick L.; Joo, Louis A.; and Martin, Thomas W. Pitch treatment means. 3,668,110, Cl. 208-45.000

Shelby, Richard K. Molding machines. 3,667,885, Cl. 425-155.

Shell Oil Company: *See—*
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Shen, Tsung-Ying; Matzuk, Alexander R.; and Dorn, Conrad P., Jr., to Merck & Co., Inc. Methylsulfinylmethylthiazole. 3,668,212, Cl. 260-302.00r

Shepard, Leonard F., to ILC Industries, Inc. Ventilation system for inflatable pressure garments. 3,667,460, Cl. 128-142.5

Sheppard, John E.; and Pellechia,Vincent J., to General Instrument Corporation, mesne. Method for bonding with deposited particulate glass. 3,667,925, Cl. 65-43.000

Sherman, Richard M.; and Webb, Robert M., to Graco, Inc. Electrostatic powder coating apparatus. 3,667,675, Cl. 239-15.

Sherman, Richard M.: *See—*
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Sherrick James W., to Lord Corporation. Railway car having resilient center bearing. 3,667,820, Cl. 308-137.000

Shiba, Keisuke; Akira, Sato; and Tsubota, Motohiko, to Fuji Photo Film Co., Ltd. Spectrally super sensitized silver halide photographic emulsion. 3,667,960, Cl. 96-124.000

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Shields, William B.; Willems, Victor H.; and Sailer, William F., to Gilbert Associates, Inc. Ground detection circuit for a D.C. distribution network. 3,668,472, Cl. 317-18.

Shima, Takesaburo; Yamagishi, Akio; Sada, Masao; Yamamoto, Zenichi; and Shiozaki, Hasunaga, to Sumitomo Chemical Company, Ltd. Process for producing-aminoacids. 3,668,221, Cl. 260-326.14t

Shimada, Satoshi, to Sony Corporation. Electron type fluorescent display device with planar adjacent control electrode. 3,668,466, Cl. 315-169.0tv

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Shimizu, Mineo; Takechi, Hiroshi; Kajioka, Hiroyuki; and Kawaharada, Minoru, to Nippon Steel Corporation. Process for producing cold-rolled steel plate high in the cold-formability. 3,668,016, Cl. 148-2.

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Shoemaker, Carlyle E., to Bethlehem Steel Corporation. Heat-stable rust inhibitors. 3,668,021, Cl. 148-12.100

Short, Oliver A., to Du Pont de Nemours, E. I., and Company. Process for preparing nitrogen-free platinum powders. 3,667,935, Cl. 75-109.000

Short, Oliver A., to Du Pont de Nemours, E. I., and Company. Method of making printing masks with high energy beams. 3,668,028, Cl. 156-3.000

Shryock, Robert Stanley. Camper Kitchen and utility trailer. 3,667,799, Cl. 296-23.00b

Shufran, Stephen: *See—*
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Shyne, James J.; and Milewski, John V., to General Technologies Corporation. Three-dimensional crystal whiskers and method for preparation thereof. 3,668,062, Cl. 161-177.000

Sicher, Frederic A.; and Gaysowski, Joseph, said Gaysowski assor. to said Sicher. Automatic machine for vending fried foods. 3,667,373, Cl. 99-407.

S.I.D.A.R.O. Societe Industrielle de Dispositifs Automatiques Robomatic: *See—*
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Sidel, Le Havre: *See—*
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Siebert, Hans Joachim; and Neelen, Gregorius Theodorus Maria, to U.S. Philips Corporation. Seal for piston-cylinder assembly. 3,667,349, Cl. 92-83.000

Siekanowicz, Wieslaw Wojciech, to RCA Corporation. Broadband circulator wherein diffential phase shift varies with frequency in predetermined manner. 3,668,563, Cl. 333-1.100

Siemens Aktiegesellschaft: *See—*
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Silagy, Richard J., to Weatherhead Company, The. Combination brake warning switch and proportioning valve. 3,667,810, Cl. 303-6.00c

Silfverlin, Ade William, to Sandvikens Jernverks Aktiebolag. Laminated packing material with spaced parallel reinforcing members. 3,668,049, Cl. 161-38.000

Silver, Joseph, to Crest Ultrasonics Corporation. Load-sensitive generator for driving piezo- electric transducers. 3,668,486, Cl. 318-116.000

Simmons, John Richard: *See—*
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Simon, Gunter, to Didier-Werke A.G. Furnace wall particularly for open-hearth furnaces. 3,667,181, Cl. 52-496.000

Simonen, Thomas C.: *See—*
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Simpson, Samuel W., to Shell Oil Company. Method for determining the freezing point of a hydrocarbon. 3,667,280, Cl. 73-17.

Sims, Willard M., to Foster Grant Co., Inc. Nylon compositions containing diisocyanate mold release agents. 3,668,171, Cl. 260-32.4

Sinclair, William Y., to Thomas & Betts Corporation. Matric switch with improved flexible insulative spacer arrangement. 3,668,337, Cl. 200-5.00a

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Kleinschmidt, Johann O.; Walter, Heinz E.; and Holl, Helmar H., 3,667,413.
Pilger, Allan B., 3,668,502.

Singleton, Albert. Hanger bracket and driving apparatus for plating barrels. 3,668,103, Cl. 204-213.000

Sinkovitz, Gloria Di Marco: *See—*
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Sinusas, Robert R., to Monsanto Company. Cathode ray tube deflection system utilizing electromagnetic and electrostatic beam deflection. 3,668,462, Cl. 315-23.000

Sirrine, Edwin B.: *See—*
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Skafte, Stanly F., to Williams Furnace Co. Oven heater combination. 3,667,450, Cl. 126-85.00b

Skrobisch, Alfred, to Allard Instrument Corporation. Segmental readout device. 3,668,700, Cl. 340-378.

Skromme, Arnold Burton; Lindstrom, Harold Richard; Henningsen, Etlar August; Beldin, Royal Lowell; Sorlie, Donald Thomas; and Eckert, Elmer Richard, to Deere & Company. Feed-mixing apparatus. 3,667,734, Cl. 259-44.000

Skutella, Stanislaus. Oil gauge. 3,667,295, Cl. 73-290.

Slana, Matthew Francis, to Bell Telephone Laboratories, Incorporated. Pulse code modulation multiplex system. 3,668,291, Cl. 179-15.0ap

Slavik, William H.: *See—*
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Sliva, Martin E.; and Kwok, Roderic P., to Johnson & Johnson. Sterilization indicator. 3,667,916, Cl. 23-230.00r

Sluse, Guy; and Joannes, Gustave, to Solvay & Cie. Process for the coating of electrodes. 3,668,005, Cl. 117-215.000

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Smedley, Paul A.; and Smedley, Anderson B. Switch for power lines actuated by a rotatable supporting insulator. 3,668,341, Cl. 200-48.

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Smeltzer, John F. Combination fishing rod and flashlight holder attachment. 3,667,708, Cl. 248-39.000

Smestad, Dale E.; and Quackenbush, Nelson E., to United States of America, Army. Heat resistant coating for solder connections. 3,668,174, Cl. 260-373.00b

Smilgys, Bruno S.; and Ritchie, Robert C., to Veeder Industries Inc. Printer. 3,668,375, Cl. 235-94.00r

Smith, A. O., Corporation: *See—*
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Smith, A. O.,-Inland Inc.: *See—*
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Smith, Chester L.; and Szabo, Louis R., to United States of America, Army. Flare radiometer. 3,667,850, Cl. 356-186.000

Smith, Donald D. Air deflection plate for a vehicle. 3,667,369, Cl. 98-2.120

Smith, Edwin R.; and Cafolla, Constantine F., to SFM Corporation. Tool changing and transfer mechanism. 3,667,114, Cl. 29-568.

Smith, George M.: *See—*
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Smith, Harry A.; and Rooker, Bobbie E., to Dow Chemical Company, The. Adducts of N-substituted aziridines and organic acid anhydrides. 3,668,191, Cl. 260-78.40r

Smith International, Inc.: *See—*
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Smith, Lawrence Edward; and Gries, Robert Joseph, to RCA Corporation. Raster correction circuit utilizing vertical deflection signals, and high voltage representative signal, to modulate the voltage regulator circuit. 3,668,463, Cl. 315-27.0gd

Smith, Leary W.: *See—*
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Smith, Percy L.: *See—*
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Smith, Richard E., to Xerox Corporation. Developing systems. 3,667,428, Cl. 118-637.000

Smitherman, Eugene A. Method for handling column of drill pipe during drilling operations. 3,667,554, Cl. 175-57.

Smyth, Donald N., to S.A. Brush Company Limited. Liquid feed control for cleaning apparatus. 3,667,853, Cl. 401-291.000

Snam Progetti S.p.A.: *See—*
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Snoy, Joseph B.; and Shull, Bradford K., to Twin Disc, Incorporated. Selector valve assembly with mechanical latch. 3,667,501, Cl. 137-612.100

Snyder, Stephen L. Automatic control system for parachutes. 3,667,705, Cl. 244-150.000

Sobukawa, Masukuni: *See—*
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Societe Internationale d'Application de Procedes Industriels (S.I.A.P.I.) S.A.:*See—*
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Sousa, Lionel Anthony James: *See—*
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Spalding, Donald P.; and Close, James G. Coat hanger having theft alarm. 3,668,680, Cl. 340-280.000

Spaulding, David B., to Novatek, Inc. Method and apparatus for vehicle control and guidance. 3,668,624, Cl. 340-32.000

Special Metals Corporation: *See—*
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Spencer, Francis T., to West Point-Pepperell, Inc. Apparatus for preparing flocked fabric. 3,667,665, Cl. 222-412.000

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Potash, Hanan, 3,668,532.

Spieth, Rudolf. Threaded ring. 3,667,525, Cl. 151-21.00c

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Sprecher, Raymond G., to General Motors Corporation. Automatic locking restraint belt linear retractor. 3,667,806, Cl. 297-388.000

Sprong, Edmund Jay. Fabric pleater guide. 3,667,677, Cl. 223-34.

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Sta-Rite Industries, inc.: *See—*
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File, Harold T., to Aspro, Nicholas Ltd. Tablet. 223,759, 6–6–72, Cl. D16—3.

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Gerlach, John R. Door handle and lock plate unit. 223,745, 6–6–72. Cl. D8—170.

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Gorman, Dewitt Y. Entertainment center. 223,764, 6–6–72. Cl. D26—14.

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Miyachi, Einosuke, and N. Aratani, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 223,790, 6–6–72, Cl. D90—8.

Modern Plastic Sales: *See*—
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Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
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Seals, Bob J. Vehicle tire carrier actuating lever. 223,753, 6–6–72, Cl. D14—6.

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CLASSIFICATION OF PATENTS

ISSUED JUNE 6, 1972

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57 3,667,554
60 3,667,555
73 3,667,556
242 3,667,557
246 3,667,558
392 3,667,559

CLASS 176

3 3,668,065
5 3,668,066
7 3,668,068
38 3,668,069
40 3,668,070

CLASS 177

211 3,667,560
245 3,667,561

CLASS 178

5.4CD 3,668,309
5.4HE 3,668,306
5.4ST 3,668,304
5.4M 3,668,305
5.6 3,668,307
6.6A 3,668,308
3,668,310
6.7R 3,668,311
6.8 3,668,312
19 3,668,313
69G 3,668,314
69.5TV 3,668,316
69.5R 3,668,315

CLASS 179

1CN 3,668,289
1PC 3,668,321
3,668,324
1VC 3,668,322
1VE 3,668,323
1A 3,668,320
6TA 3,668,326
6C 3,668,325
6.3R 3,668,290
15AA 3,668,318
15AP 3,668,291
15AQ 3,668,328
15FD 3,668,327
18BF 3,668,317
18ES 3,668,319
3,668,330
18J 3,668,329
84R 3,668,331
100.2C 3,668,332
3,668,333
107R 3,668,334
111R 3,668,335
3,668,336

CLASS 180

5R 3,667,562
68.5 3,667,563
79.1 3,667,564
89 3,667,565
3,667,566
117 3,667,567

CLASS 181

31B 3,667,568
31R 3,667,569
36A 3,667,571
36R 3,667,570

CLASS 182

220 3,667,572

CLASS 184

1.5 3,667,573
7R 3,667,574

CLASS 188

134 3,667,575
345 3,667,576

CLASS 192

.08 3,667,577
4A 3,667,579
8R 3,667,578
12A 3,667,580
18A 3,667,581
99A 3,667,582
105A 3,667,583

CLASS 193

37 3,667,584

CLASS 194

101 3,667,585

CLASS 195

28N 3,668,071
29 3,668,072
3,668,073
62 3,668,074
103.5R 3,668,076
103.5 3,668,075

CLASS 198

1 3,667,586
25 3,667,587
38 3,667,588
127 3,667,589
220BA 3,667,590
220R 3,667,591

CLASS 200

5A 3,668,337
6BB 3,668,345
11A 3,668,338
19 3,668,339
42T 3,668,340
48R 3,668,341
52R 3,668,342
3,668,343
3,668,344
61.41 3,668,346
76 3,668,347
80 3,668,348
82R 3,668,349
144B 3,667,871
3,668,350
144 3,668,351
148R 3,668,352
153K 3,668,353
153S 3,668,354
166C 3,668,355
172A 3,668,356

CLASS 201

25 3,668,077

CLASS 203

3 3,668,078

CLASS 204

1.5 3,668,084
2 3,668,079
9 3,668,080
12 3,668,081
30 3,668,082
43 3,668,083
57 3,668,085
59R 3,668,086
99 3,668,087
101 3,668,088
143R 3,668,089
145R 3,668,090
158R 3,668,091
3,668,092
159.23 3,668,093
164 3,668,095
165 3,668,096
3,668,097
181 3,668,098
3,668,100
195B 3,668,102
195S 3,668,099
195 3,668,101
213 3,668,103
279 3,668,104
297R 3,668,105
299 3,668,106
301 3,668,107
323 3,668,108

CLASS 206

16R 3,667,592
46FR 3,667,593
46R 3,667,594
53 3,667,595
57R 3,667,596
58 3,667,597
65S 3,667,598

CLASS 208

10 3,668,109
45 3,668,110
48AA 3,668,111
89 3,668,112
97 3,668,113
120 3,668,114
143 3,668,115
216 3,668,116
228 3,668,117

CLASS 209

12 3,667,599
144 3,667,600
196.1 3,667,924
466 3,667,601

CLASS 210

30 3,668,118
42 3,668,119
60 3,668,120
67 3,667,602
130 3,667,603
136 3,667,604
170 3,667,605
193 3,667,606
198 3,667,607
242 3,667,608
3,667,609
3,667,610
244 3,667,611
321 3,667,612
336 3,667,613
401 3,667,614
451 3,667,616
497.1 3,667,615

CLASS 211

128 3,667,617

CLASS 212

3,667,618

CLASS 214

1PB 3,667,619
1P 3,667,620
3,667,621
6DK 3,667,628
6A 3,667,622
7 3,667,623
8.5A 3,667,624
10.5D 3,667,625
17B 3,667,626
23 3,667,627
83.3 3,667,629
86A 3,667,630
3,667,631
130R 3,667,632
145 3,667,633
340 3,667,634
515 3,667,635

CLASS 215

9 3,667,636
3,667,637
32 3,667,638

CLASS 217

4R 3,667,639

CLASS 219

10.55 3,668,357
10.65 3,668,358
60A 3,668,359
61 3,668,360
69C 3,668,361
87 3,668,362
98 3,668,363
125R 3,668,364
149 3,668,365
158 3,668,366
212 3,668,367
213 3,668,368
243 3,668,369
373 3,668,370
413 3,668,371
450 3,668,372
505 3,668,373

CLASS 220

23.4 3,667,647
24.5 3,667,640
26S 3,667,641
39R 3,667,642
41 3,667,648
54 3,667,643
55Y 3,667,649
82.5 3,667,645
85R 3,667,646
89A 3,667,644

CLASS 221

250 3,667,650

CLASS 222

63 3,667,651
145 3,667,652
217 3,667,653
336 3,667,654
412 3,667,665
464 3,667,655
524 3,667,656
541 3,667,657
569 3,667,658

CLASS 223

32 3,667,659
34 3,667,677

CLASS 225

1 3,667,660
2 3,667,661
96.5 3,667,662
100 3,667,663

CLASS 226

30 3,667,664

CLASS 229

16B 3,667,666
51TS 3,667,667

CLASS 234

15 3,667,668
24 3,667,669

CLASS 235

60MT 3,667,670
92C 3,668,374
94R 3,668,375
96 3,667,671
98B 3,667,672
150.23 3,668,403
151.11 3,668,377
151.22 3,668,376
155 3,668,378
183 3,668,379
197 3,668,380

CLASS 239

1 3,667,673
15 3,667,674
3,667,675
3,667,676
102 3,667,678
3,667,679
265.17 3,667,680
393 3,667,681
412 3,667,682
428.5 3,667,683
533 3,667,684
542 3,667,685
553.3 3,667,687
585 3,667,686

CLASS 240

106 3,668,381

CLASS 241

1 3,667,688
15 3,667,689
20 3,667,690
24 3,667,691
36 3,667,692
99 3,667,693
186R 3,667,694

CLASS 242

55 3,667,695
72 3,667,696
3,667,697
107.4 3,667,698
129 3,667,699
189 3,667,700
192 3,667,701

CLASS 243

32 3,667,702

CLASS 244

53B 3,667,703
3,667,704
150 3,667,705

CLASS 248

9 3,667,706
20 3,667,707
39 3,667,708
48.2 3,667,717
59 3,667,709
71 3,667,710
72 3,667,711
75 3,667,712

188.5 3,667,713
284 3,667,714
327 3,667,715
405 3,667,716
487 3,667,718

CLASS 249

109 3,667,719
213 3,667,720

CLASS 250

41.9TF 3,668,382
3,668,383
3,668,384
3,668,385
43.5FL 3,668,386
43.5D 3,668,392
49.5A 3,668,393
67 3,668,394
71.5R 3,668,395
83.3D 3,668,397
3,668,398
3,668,399
83.3R 3,668,396
3,668,400
83.6R 3,668,401
105 3,668,402
211J 3,668,404
216 3,668,405
220SD 3,668,406
220M 3,668,408
229 3,668,407
236 3,668,409

CLASS 251

1 3,667,721
30 3,667,722
68 3,667,723
138 3,667,724
151 3,667,725
3,667,726
172 3,667,727

CLASS 252

8.1 3,668,121
8.5A 3,668,122
8.5C 3,668,123
8.5P 3,668,129
8.57 3,668,124
59 3,668,125
62.1 3,668,126
3,668,127
63 3,668,128
79.2 3,668,130
79.4 3,668,131
80 3,668,132
88 3,668,133
89 3,668,134
107 3,668,135
117 3,668,136
149 3,668,137
180 3,668,094
181 3,668,138
186 3,668,139
301.4P 3,668,141
301.4R 3,668,140
3,668,143
301.5 3,668,142
400 3,668,144
421 3,668,145
428 3,668,146
431C 3,668,228
432 3,668,147
440 3,668,148
448 3,668,149
466 3,668,151
477 3,668,152
528 3,668,153

CLASS 254

8R 3,667,728
77 3,667,729
86R 3,667,730
190R 3,667,731

CLASS 259

4 3,667,732
6 3,667,733
44 3,667,734
151 3,667,735
161 3,667,736
164 3,667,737
171 3,667,738

CLASS 260

2.5AR 3,668,154
2.5FP 3,668,155
2.5E 3,668,161
5 3,668,156
13 3,668,157
17R 3,668,158
18EP 3,668,159
19R 3,668,160
27 3,668,162
3,668,170
28.5D 3,668,163
29.3 3,668,164
29.6BM 3,668,166
29.6F 3,668,167
29.6T 3,668,165
29.7R 3,668,168
31.8XA 3,668,169
32.4R 3,668,171
32.6N 3,668,173
32.6R 3,668,172
33.4R 3,668,175
37EP 3,668,176
3,668,177
37SB 3,668,174
40R 3,668,178
41A 3,668,179
46.5R 3,668,180
47XA 3,668,181
47C 3,668,182
65 3,668,183
67TN 3,668,184
75NC 3,668,186
75NH 3,668,185
77 3,668,187
3,668,188
78R 3,668,189
3,668,190
78.4R 3,668,191
79.5P 3,668,192
86.3 3,668,194
94.7R 3,668,195
239AA 3,668,197
239A 3,668,196
239B 3,668,199
239D 3,668,215
239.1 3,668,198
3,668,200
243C 3,668,201
3,668,202
3,668,203
248C 3,668,204
256.4Q 3,668,205
268BC 3,668,206
283S 3,668,208
286R 3,668,207
290A 3,668,209
293.59 3,668,210
294.9 3,668,211
302R 3,668,212
304 3,668,213
307B 3,668,216
307F 3,668,214
309.5 3,668,217
314.5 3,668,218
325 3,668,219
326.11 3,668,220
326.14T 3,668,221
343.2R 3,668,222
3,668,223
345.3 3,668,224
368 3,668,225
410.6 3,668,226
429J 3,668,227
448.8R 3,668,229
465.4 3,668,230
3,668,231
471A 3,668,232
471C 3,668,233
473G 3,668,234
475PR 3,668,235
485G 3,668,237
485H 3,668,236
488 3,668,238
497R 3,668,239
501.12 3,668,240
520 3,668,241
521A 3,668,242
3,668,244
533N 3,668,245
534E 3,668,246
535R 3,668,243
543R 3,668,248
544M 3,668,247
546 3,668,249
555A 3,668,250
558R 3,668,251
566R 3,668,252
570R 3,668,253
576 3,668,254
586R 3,668,255
593P 3,668,256
604AC 3,668,257
609F 3,668,258
610B 3,668,259
611A 3,668,260
622R 3,668,261
653.1T 3,668,262
665R 3,668,263
671 3,668,264
672T 3,668,265
674SA 3,668,267
674 3,668,266
676R 3,668,269
676 3,668,268
683D 3,668,270
683.9 3,668,271
824R 3,668,273
826 3,668,272
850 3,668,275
3,668,276
3,668,277
857PA 3,668,193
857G 3,668,274
857L 3,668,278
879 3,668,279
897B 3,668,280
897C 3,668,281
944 3,668,282

CLASS 261

1 3,667,739
39A 3,667,740
50A 3,667,741

CLASS 263

6E 3,667,742
7 3,667,743
40R 3,667,744

CLASS 264

.5 3,668,283
3,668,284
3,668,285
26 3,668,286
46 3,668,287
47 3,668,288

CLASS 266

21 3,667,746
24 3,667,747
33R 3,667,745
42 3,667,748

CLASS 267

112 3,667,749

CLASS 271

44R 3,667,750
49 3,667,751
53 3,667,752
64 3,667,753

CLASS 272

8P 3,667,754
70.1 3,667,755
86 3,667,756

CLASS 273

106.5C 3,667,758
135G 3,667,757
152.1 3,667,759
157R 3,667,760
186A 3,667,761

CLASS 274

4D 3,667,762
9R 3,667,763
3,667,764
14 3,667,765

CLASS 277

22 3,667,766
95 3,667,767

CLASS 279

83 3,667,768

CLASS 280

11.35M 3,667,771
11.35T 3,667,769
3,667,770
16 3,667,772
30 3,667,773
43.17 3,667,774
124F 3,667,775
150R 3,667,776
432 3,667,778
473 3,667,779
480 3,667,777
502 3,667,780

CLASS 285

45 3,667,781
110 3,667,782
161 3,667,783
173 3,667,784
231 3,667,785

CLASS 287

20.94 3,667,786
53H 3,667,787
58CT 3,667,788
87 3,667,789

CLASS 289

17 3,667,790

CLASS 290

38R 3,668,410
38 3,668,411
53 3,668,412

CLASS 292

216 3,667,791
3,667,792
3,667,793
264 3,667,794

CLASS 294

86.17 3,667,795
88 3,667,796
103R 3,667,797
104 3,667,798

CLASS 296

23B 3,667,799
23G 3,667,800
24R 3,667,801
98 3,667,802

CLASS 297

119 3,667,803
362 3,667,804
385 3,667,805
388 3,667,806
389 3,667,807

CLASS 299

33 3,667,808

CLASS 300

11 3,667,809

CLASS 302

59 3,667,814

CLASS 303

6C 3,667,810
7 3,667,815
21AF 3,667,812
21EB 3,667,813
21F 3,667,811
3,667,816

CLASS 307

2 3,668,413
66 3,668,418
3,668,419
88.3 3,668,420
104 3,668,414
106 3,668,415
3,668,416
113 3,668,417
117 3,668,421
133 3,668,422
208 3,668,423
214 3,668,424
216 3,668,425
229 3,668,427
3,668,428
235 3,668,426
3,668,429
3,668,430
243 3,668,431
247A 3,668,432
3,668,433
257 3,668,434
260 3,668,435
262 3,668,436
265 3,668,437
279 3,668,438
309 3,668,439
310 3,668,440

CLASS 308

4A 3,667,817
92 3,667,818
135 3,667,819
137 3,667,820
212 3,667,821
213 3,667,822
237 3,667,823

CLASS 310

8.1 3,668,441
8.2 3,668,442
12 3,668,443
13 3,668,444
77 3,668,445
90 3,668,446
166 3,668,447
3,668,448
236 3,668,449
237 3,668,450
248 3,668,451
266 3,668,452

CLASS 312

39 3,667,825
118 3,667,826

CLASS 313

7 3,668,453
57 3,668,454
92R 3,668,387
95 3,668,388
96 3,668,389
109 3,668,455
220 3,668,390
318 3,668,391
3,668,456
325 3,668,458
346 3,668,457

CLASS 315

3.5 3,668,459
3,668,460
22 3,668,461
23 3,668,462
24 3,668,464
27GD 3,668,463
107 3,668,465
169TV 3,668,466
292 3,668,467
323 3,668,468

CLASS 316

23 3,667,824

CLASS 317

18D 3,668,469
3,668,470
3,668,471
18R 3,668,472
28R 3,668,474
33SC 3,668,483
61.5 3,668,475
100 3,668,477
101DH 3,668,476
101A 3,668,478
141S 3,668,479
234R 3,668,473
3,668,484
234 3,668,480
3,668,481
260 3,668,482

CLASS 318

102 3,668,485
116 3,668,486
128 3,668,487
138 3,668,488
227 3,668,489
245 3,668,490
305 3,668,491
314 3,668,492
345 3,668,493
373 3,668,494
400 3,668,495
466 3,668,496
471 3,668,497
568 3,668,498
587 3,668,499
601 3,668,500
632 3,668,501
653 3,668,502
665 3,668,503

CLASS 320

64 3,668,504

CLASS 321

2 3,668,505
8C 3,668,506
11 3,668,507
18 3,668,508
3,668,509

CLASS 322

28 3,668,514

CLASS 323

8 3,668,510
22SC 3,668,515
43.5S 3,668,511
45 3,668,512
60 3,668,513

CLASS 324

28R 3,668,516
38 3,668,517
51 3,668,518
96 3,668,519
106 3,668,520
3,668,521
158D 3,668,523
158T 3,668,522
162 3,668,524

CLASS 325

1 3,668,525
64 3,668,526
115 3,668,527
352 3,668,528

CLASS 328

129 3,668,529
147 3,668,530
150 3,668,531
151 3,668,532
168 3,668,533
207 3,668,534

CLASS 329

192 3,668,535

CLASS 330

4.3 3,668,536
3,668,537
9 3,668,538
17 3,668,539
18 3,668,540
23 3,668,541
3,668,542
30D 3,668,543
43 3,668,544
207P 3,668,545

CLASS 331

94.5 3,668,546
3,668,547
3,668,548
3,668,549
3,668,550
96 3,668,551
100 3,668,552
107G 3,668,553
107R 3,668,554
3,668,555
109 3,668,556
112 3,668,557

CLASS 332

7.51 3,668,558
9R 3,668,559
3,668,562
9 3,668,560
31T 3,668,561

CLASS 333

1.1 3,668,563
6 3,668,564
3,668,565
17 3,668,566
21A 3,668,567
30R 3,668,569
30 3,668,568
70A 3,668,570
79 3,668,571
81B 3,668,572
84R 3,668,573
95S 3,668,574

CLASS 335

140 3,668,575
153 3,668,576
192 3,668,577
202 3,668,578
207 3,668,579
213 3,668,580
216 3,668,581
285 3,668,582

CLASS 336

58 3,668,583
60 3,668,584
83 3,668,585
123 3,668,587
192 3,668,588
210 3,668,586
212 3,668,589

CLASS 337

51 3,668,590
319 3,668,592
3,668,593
380 3,668,594

CLASS 338

32R 3,668,596
38 3,668,595
198 3,668,597
274 3,668,598
289 3,668,599
320 3,668,600

CLASS 339

14R 3,668,601
3,668,602
3,668,603
17CF 3,668,604
18B 3,668,605
19 3,668,606
41 3,668,607
64M 3,668,608
74R 3,668,610
75R 3,668,611
94C 3,668,612
97C 3,668,613
97R 3,668,609
111 3,668,614
198N 3,668,591
206R 3,668,615
258R 3,668,616

CLASS 340

4E 3,668,617
15.5BH 3,668,619
15.5DS 3,668,618
15.5RC 3,668,620
27NA 3,668,623
27R 3,668,621
3,668,622
32 3,668,624
38R 3,668,625
51 3,668,626
52D 3,668,628
52H 3,668,627
53 3,668,629
59 3,668,630
146.1AX 3,668,631
146.1 3,668,632
146.3AE 3,668,636
146.3AG 3,668,634
3,668,637
146.3E 3,668,633
146.3H 3,668,638
146.3P 3,668,635
166R 3,668,639
167B 3,668,640
168 3,668,641
3,668,642
171R 3,668,643
172.5 3,668,644
3,668,645
3,668,646
3,668,647
3,668,648
3,668,649
3,668,650
3,668,651
3,668,652
3,668,653
3,668,654
3,668,661
173FF 3,668,656
173LS 3,668,663
173RC 3,668,662
173SP 3,668,655
173R 3,668,657
174MA 3,668,664

174TF	3,668,667
174.1A	3,668,665
174.1C	3,668,658
174.1E	3,668,666
	3,668,668
174.1F	3,668,669
	3,668,670
174.1M	3,668,671
200	3,668,672
208	3,668,673
214	3,668,674
224	3,668,675
227R	3,668,676
236	3,668,677
251	3,668,678
267R	3,668,679
280	3,668,680
	3,668,681
286R	3,668,682
309.4	3,668,683
321R	3,668,684
324A	3,668,685
	3,668,686
	3,668,687
324R	3,668,688
344	3,668,689
347AD	3,668,691
347NT	3,668,690
347SY	3,668,693
347P	3,668,692
365	3,668,659
	3,668,660
	3,668,694
	3,668,695
	3,668,696
	3,668,697
	3,668,698
373	3,668,699
378	3,668,700
409	3,668,701
CLASS 343	
5PD	3,668,703
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DESIGN PATENTS

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